MACWORLD

January 1988 $3.95
Canada $4.95
The Macintosh® Magazine

Networks– Are They Worth It?

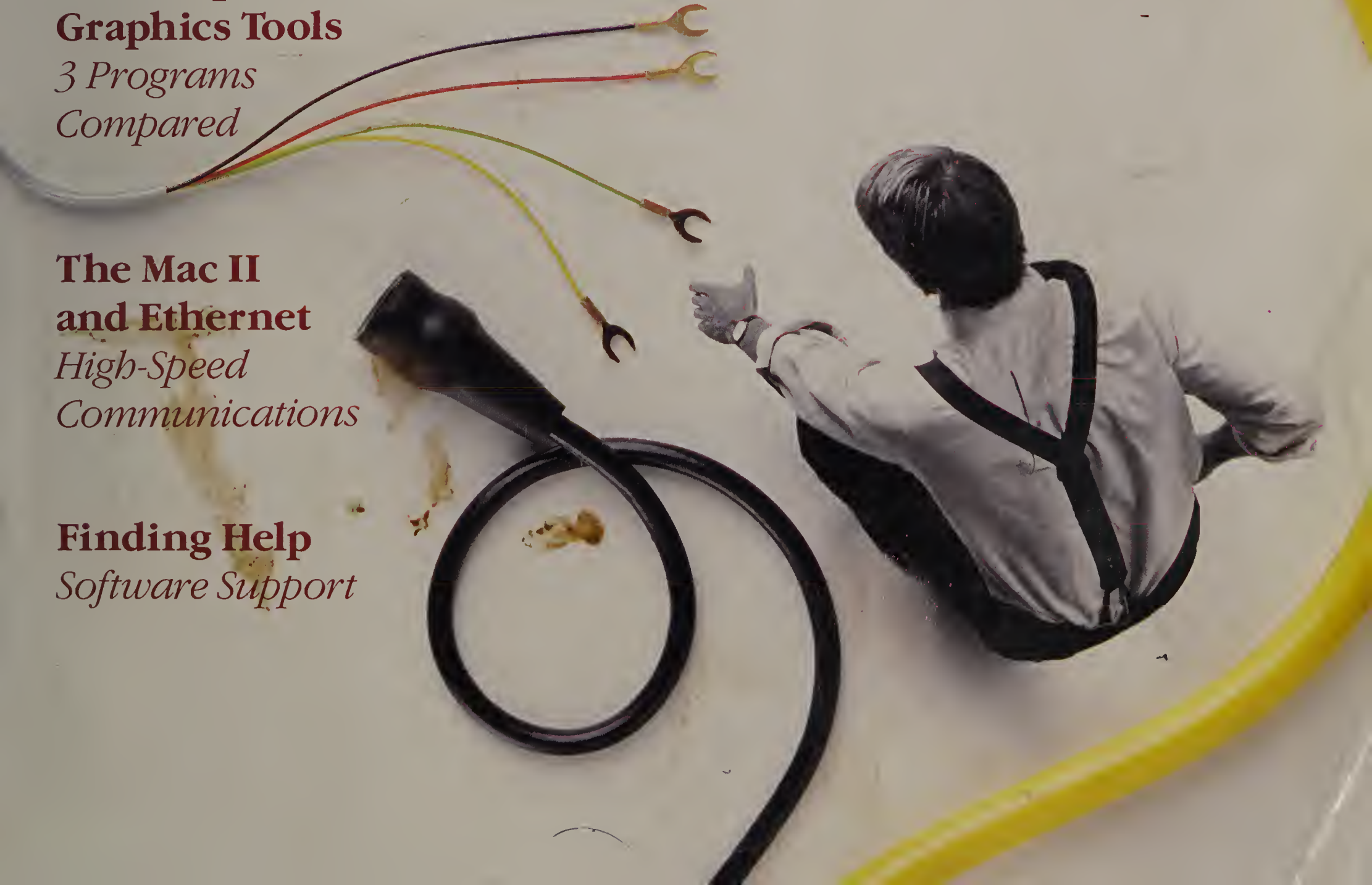
The perplexing choices

Scanners and Gray Scale
How It Works

PostScript Graphics Tools
3 Programs Compared

The Mac II and Ethernet
High-Speed Communications

Finding Help
Software Support



Nothing gets the jobs done

Some people never know where their next job's coming from. That's why there's Microsoft® Works, the winner of five major awards—including Macworld's 1987 and MacUser's 1986 *Integrated Product of the Year* awards.

Microsoft Works is a one-disk software program that gracefully integrates:

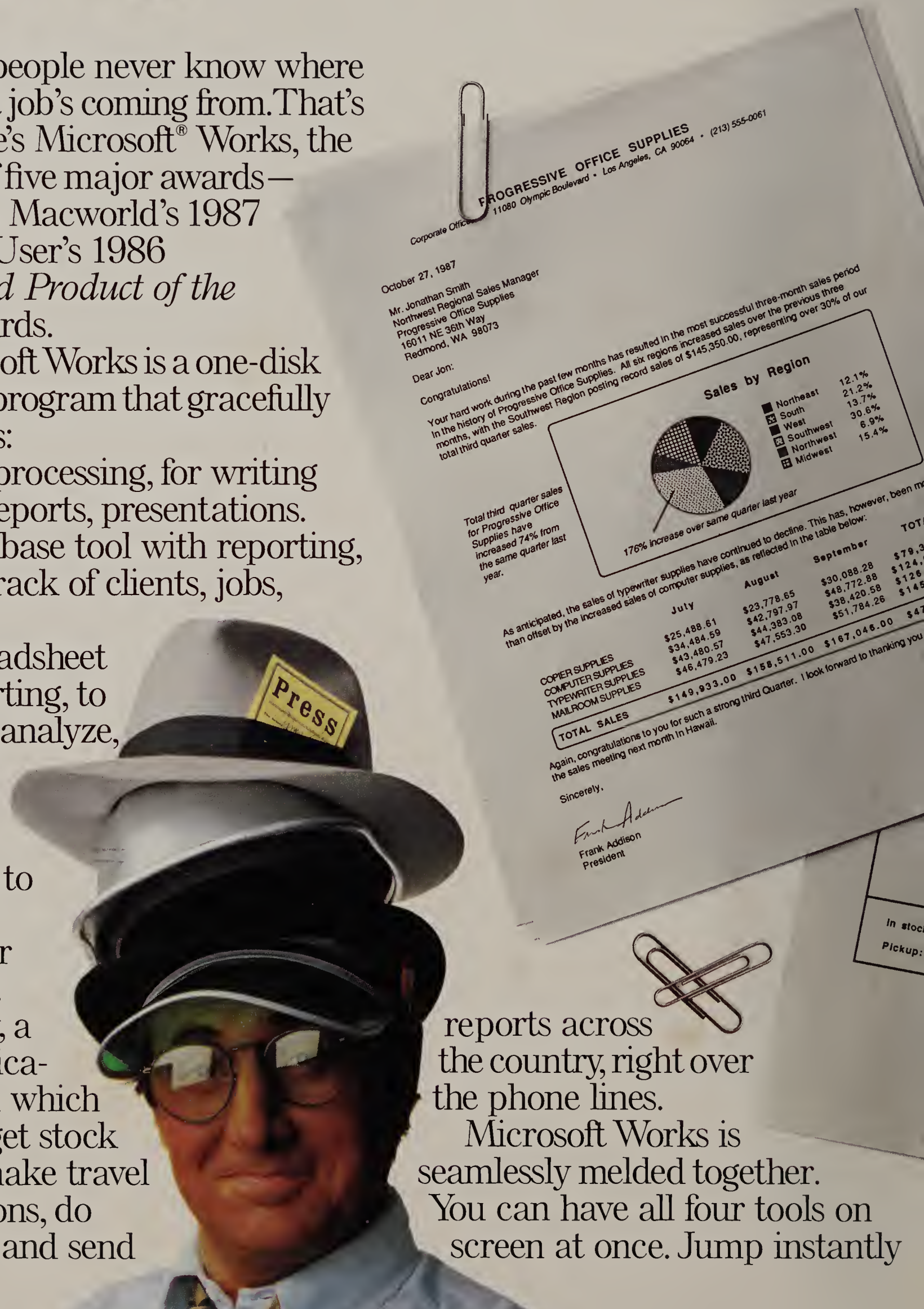
Word processing, for writing memos, reports, presentations.

A database tool with reporting, to keep track of clients, jobs, vendors.

A spreadsheet with charting, to compute, analyze, interpret, and then graph anything to do with finance or numbers.

Finally, a communications tool which lets you get stock quotes, make travel reservations, do research, and send reports across the country, right over the phone lines.

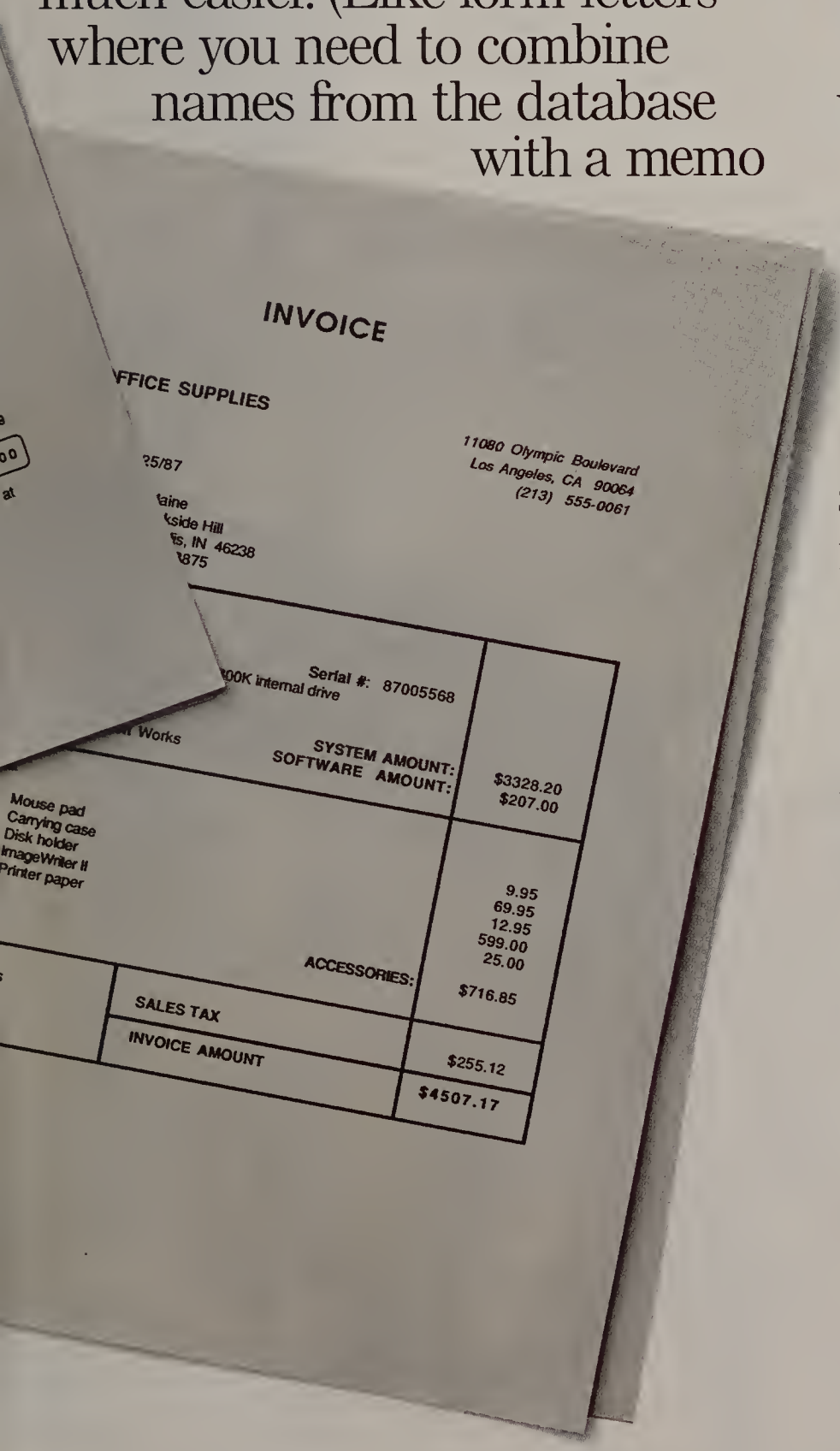
Microsoft Works is seamlessly melded together. You can have all four tools on screen at once. Jump instantly

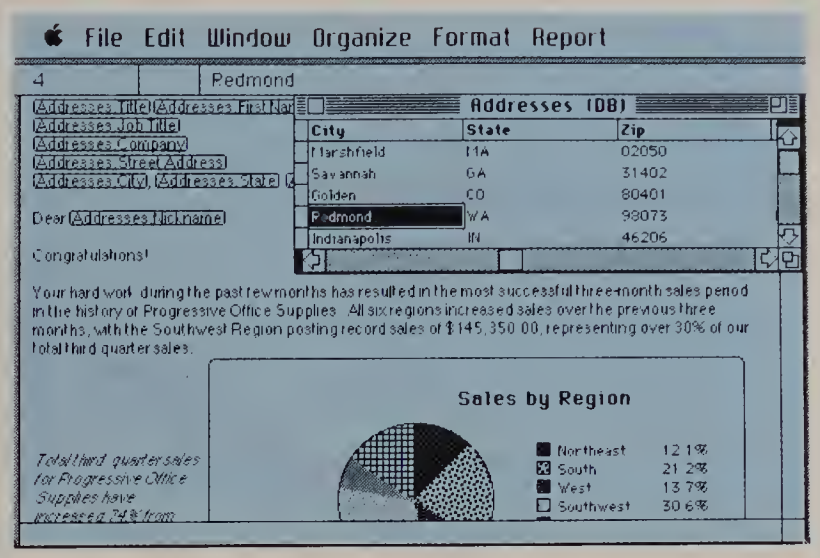


like Microsoft Works.

from one to another. And later combine work done in each part of the program on a single printed page.

This easy exchange of data makes jobs go faster and much, much easier. (Like form letters where you need to combine names from the database with a memo written in the word processor.)





Learning Microsoft Works is a snap. It starts with a painless, step-by-step, computer-based training program. Before you know it, you know it.

All in all, Microsoft Works is a superb solution for day to day, get-it-done problems—an inspiring display of convenience, efficiency, and utility.

And of course, it's a product of Microsoft, the preeminent developer of programs for the Macintosh.™

If you're in a business that won't let you stick to one thing, check out Microsoft Works—the program that can change jobs as fast as you do.

Microsoft® Works. For everyone.

For the name of the nearest Microsoft dealer, call (800) 541-1261, Dept. C74

Microsoft is a registered trademark of Microsoft Corporation. Macintosh is a trademark of Apple Computer, Inc.

MACWORLD

January 1988

The Macintosh™ Magazine

Departments

11 Mac Bulletin
Late-breaking news.

17 David Bunnell

29 Letters

41 Commentary/Jerry Borrell

46 Contributors Notes

55 Steven Levy

73 Verbatim
T/Maker president Heidi Roizen.

173 New Products
A quick look at new Mac software, hardware, and accessories.

185 How To/**Quick Tips**
Custom *PageMaker* headlines, counting *Word* words, and more.

195 How To/**Getting Started with the New Mac System**
Exploring the evolving System Folder.

209 How To/**Business Clinic**
Taking the *HyperCard* leap: put your old database into hyperdrive.

219 How To/**Insights on Adobe Illustrator**
Get a handle on this versatile PostScript illustration program.

227 How To/**Mac Charting Tools**
Turn *Excel* spreadsheets into charts.

247 Updates
The latest software upgrade news.

249 Macworld 1987 Annual Index

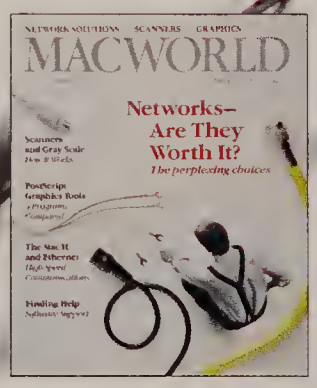
271 Where to Buy
Information on products in this issue.

292 Best-Sellers

89 Macworld News

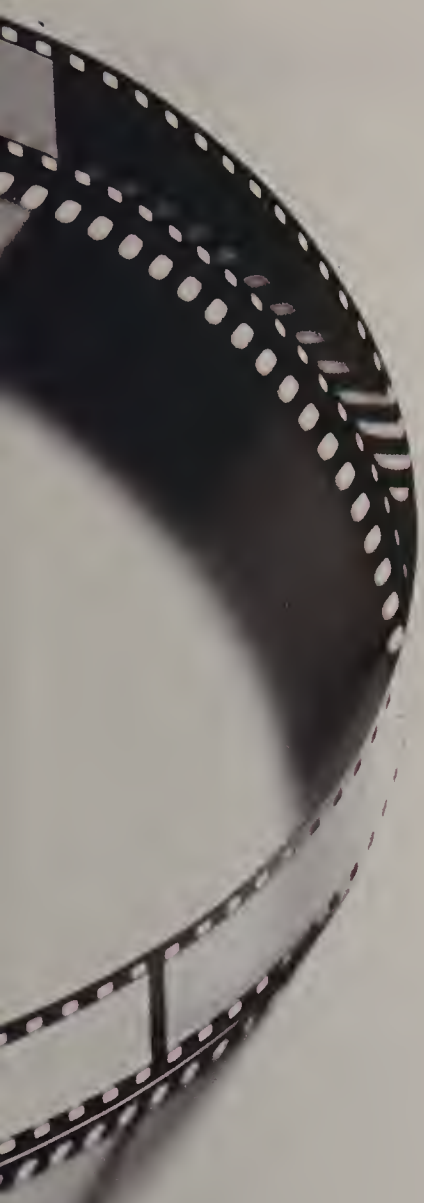
- *MacCray or Cray Mac?* The Mac as a supercomputer front end.
- *Beyond the Mouse* Three unusual input devices give the Mac a new feel.
- *Night Court* Here comes the judge (with his Mac).

Plus, HyperCard developments, *dBase Mac*'s competition, low-cost options to speed up the SE, and more big screens.



On the Cover

We've seen the future, and it's networked. On the other hand it isn't always easy, as you'll see on p.104. Ethernet (p. 128) adds more options–and confusion. (Photograph by David Bishop.)



Features

104 Network Tales
Now we know why some call them *not works.* Our own story of network travails and (ultimately) triumphs.

110 Shades of Gray
Mac scanners take a giant step forward. An introduction to gray-scale scanning.

120 HELP!
Do you need somebody to answer your software questions? Finding sources of software support.

128 The Ethernet Solution
EtherTalk explained, plus a look at the products that can hook your Macs to an Ethernet network.

138 The PostScript Difference
Choose the right PostScript graphics program: *Illustrator, Cricket Draw,* and *LaserPaint* compared.

Reviews

152 Power PostScript Printing
Varityper VT600 laser printer.

153 Because the World Is Round
Dimensions 3-D.

155 Freedom from the Mouse
QuicKeys.

156 Heavy-Duty Design
PowerTools for software analysis.

157 A Graphics Workhorse
Canvas PICT and bit-mapped graphics.

158 Come On, Let's Go
Go, the 4000-year-old strategy game.

159 A Tutor for Freshman Physics
Physics animated instruction.

160 It Won't Necessarily Get the Job
ResuméWriter takes the first step.

161 Chromatic Options
SuperChroma and *Modern Artist.*

162 This Base Is Loaded
1st Desk relational database.

163 A Concert in PostScript
Concertware+MIDI.

165 Piece of Mind
Subli-Mac and *Mac-ESP.*

166 Getting on the Bus
GPIB-SE IEEE-488 for the SE.

167 A New Image
AST TurboScan scanner.

168 QUED Pro Quo
QUED/M text editor with macros.

169 Fry the Unfriendly Skies
Tactical Jet Fighter combat game.

MACWORLD

David Bunnell
Editor-in-Chief

Jacqueline Poitier
Director/Art and Design

Jerry Borrell
Editor
Christopher Burg
Art Director

Editorial
Managing Editor: Charles Barrett
Senior Associate Editors: Adrian Mello, David Ushijima (Features)
Associate Editors: Gil Davis (News), Nancy E. Dunn (Departments), Janet McCandless (Reviews), Brita Meng (East Coast Editor)
Editorial Manager: Jane Lagas
Assistant Editors: Cathy E. Abes, Eileen Drapiza (New Products), Valerie L. Kuletz, Joe Matazzoni
Senior Copy Editor: Julie Ericksen Hagen
Copy Editors: William Freais, Felicity O'Meara, Katherine L. Ulrich
Editorial Assistant: Mark Hurlow
Editorial Administrative Assistant: Otto Waldorf
Editorial Secretary: Sharon Roe
Contributing Editors: Danny Goodman, Jim Heid, Steven Levy, Erfert Nielson, Lon Poole, Charles Seiter, Franklin Tessler, Bruce Webster

Harry Miller
Corporate Editor
Karen Wickre
Editorial Administrator

Art and Design
Designer: Susan Howard
Associate Art Director: Joanne Hoffman
Senior Design Associate: Leslie Barton
Assistant to the Director: Jon Christianson

Production
Director: Herbert Linden
Senior Production Manager: Linda Manes
Editorial Production Manager: Ellyn L. Hament
Production Editor: Susan M. Ford
Assistant Production Manager: MaryAnn DePietro
Lead Typesetter: Mark L. Duran
Typesetter: Virginia Weir
Advertising Booking Coordinator: Rosanne Reynoso
Advertising Billing Coordinator: Kevin Greene

Research
Director: Cheryl Woodard
Manager: Gary L. Rocchio
Assistant Manager: Ralph Ames
Analyst: Ray Petsche
Report Coordinator: Steven F. York

Corporate Development
Publicist: Shirley Gines
Special Projects: Jeffrey S. Glines
Administrative Assistant: Emily Bower

James E. Martin
Group Publisher

Marketing and Advertising Sales
Senior Account Manager/No. California (San Francisco): Penny Rigby (415/243-0505)
Western Advertising Manager/Northwest: Patricia Navone (415/243-0505)
No. California (San Jose): Cherie La France (415/243-0505)
Midwest: Shannon Dolan (312/827-4477)
Southeast: Judy Sutter (404/394-0758)
New England: Claire Wallace (617/879-0700)
New York: Bill Thompson (201/967-1350)
So. California, Southwest, Texas: Lisa Hillgren (213/312-8008)
Directory/⅙-Page Ads: Niki Stranz

Circulation
Director: John Griffin
Business Manager: Gail Egbert
Single-Copy Sales Manager: George Clark
Single-Copy Sales Rep: Martin Garchar
Circulation Manager: Daniel Orum
Promotion Coordinator: Ed Chittenden
Fulfillment Manager: Deborah Winders
Fulfillment Coordinator: Evelyn Adenau

Administration
Director: Janet D. McGinnis
Accounting Manager: Pat Murphy
Administrative Services Manager: Joseph Wollenweber
Employee Relations Manager: Shelly Ginenthal
Training Manager: John Knight
Technical Manager: Nancy Canning
Assistant to the President: Christina W. Spence
Assistant to the Group Publisher: Loretta Giglione

Corporate
PCW Communications, Inc.

David Bunnell
Chairman

Bartlett R. Rhoades
President & CEO

John Griffin
Vice President

Herbert Linden
Vice President

James E. Martin
Vice President

Jacqueline Poitier
Vice President

Cheryl Woodard
Vice President

Andrew Fluegelman
1943-1985
Founding Editor

January 1988
Volume 5, Number 1

Macworld™ (ISSN 0741-8647) is published monthly by PCW Communications, Inc., 501 Second St., San Francisco, CA 94107. Subscription rates are $30 for 12 issues, $60 for 24 issues, and $90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $6 per year from Canada and Mexico; add $12 per year for surface mail or $80 per year for airmail from all other countries. Second-class postage paid at San Francisco. POSTMASTER: Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries call 800/621-5461, in California 800/521-8455. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.
For subscriber service questions call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529.
Macworld is a publication of PCW Communications, Inc. *Macworld* is an independent journal not affiliated with Apple Computer, Inc.
APPLE, the APPLE LOGO, and MACINTOSH are registered trademarks, and MAC, MACWORLD, and MACLETTER are trademarks of Apple Computer, Inc. Printed in the United States of America.
Copyright ©1987 PCW Communications, Inc. All rights reserved
Macworld is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month.

IDG COMMUNICATIONS

BPA

A disk each month

PACKED with PROGRAMS

Over 500,000 sold to homes, schools and offices.

DISCOVER UPTIME. Build an exciting library of programs for less than one dollar each. You deserve value. At UPTIME value is yours. Each month over 30,000 people just like you enjoy UPTIME. Your disk arrives with eight programs and more every month...

Enjoy eight programs including two new desk accessories on each monthly disk. Make your life easier. Get more from your Macintosh. Organize and be more productive with **home** and **business management** programs. Learn with **educational** programs. Enjoy all the **games** and **adventures.** Using your Macintosh is now a snap with **tutorials** and **desk accessories.**



It's easy, inexpensive and fun. It's UPTIME! Too good to be true? There's even more! Each monthly disk has reviews of the latest software, hardware and peripherals. Save time and money. Learn the strengths and weaknesses of each item we evaluate. Shop "on the disk" in our Micro Discount Mall.

Subscribe now and save. You won't believe the low price! Satisfaction is guaranteed — or your money back. You'll be amazed at just how much comes on every UPTIME disk. Make the very next one yours. Fill out the coupon. For immediate service call toll-free:

1-800-437-0033
anytime, day or night.

QUALITY PROGRAMS
LESS THAN $1 EACH

NEW

FOR ALL MACINTOSH COMPUTERS

FROM **Volume 1, No. 8**

Small View ■ Alphabet Talker ■ Saviour DA ■ Armonk Font ■ File Function Key ■ Kaleido ■ Panic! ■ Stuntcopter

Circle 537 on reader service card

I'LL BYTE!!! SAVE $89.90 → 12 Disk Issues $89 ☐
6 Disk Issues $59 ☐
3 Disk Issues $36 ☐
1 Disk Issue $14.95 ☐

I'm a Macintosh enthusiast who wants more. Please start my subscription to **UPTIME** immediately.
(Add $2 per issue in foreign countries, except Canada and APO)

Name _____ Address _____ City _____ State ____ Zip _____
Type of Computer _____
☐ Payment enclosed. (Please make checks payable to UPTIME.)
Bill my: ☐ Visa ☐ MC Exp. Date _____
Signature _____ Account No. _____

Send to:
UPTIME · PO Box 299
Newport, RI 02840
(401) 849-4925

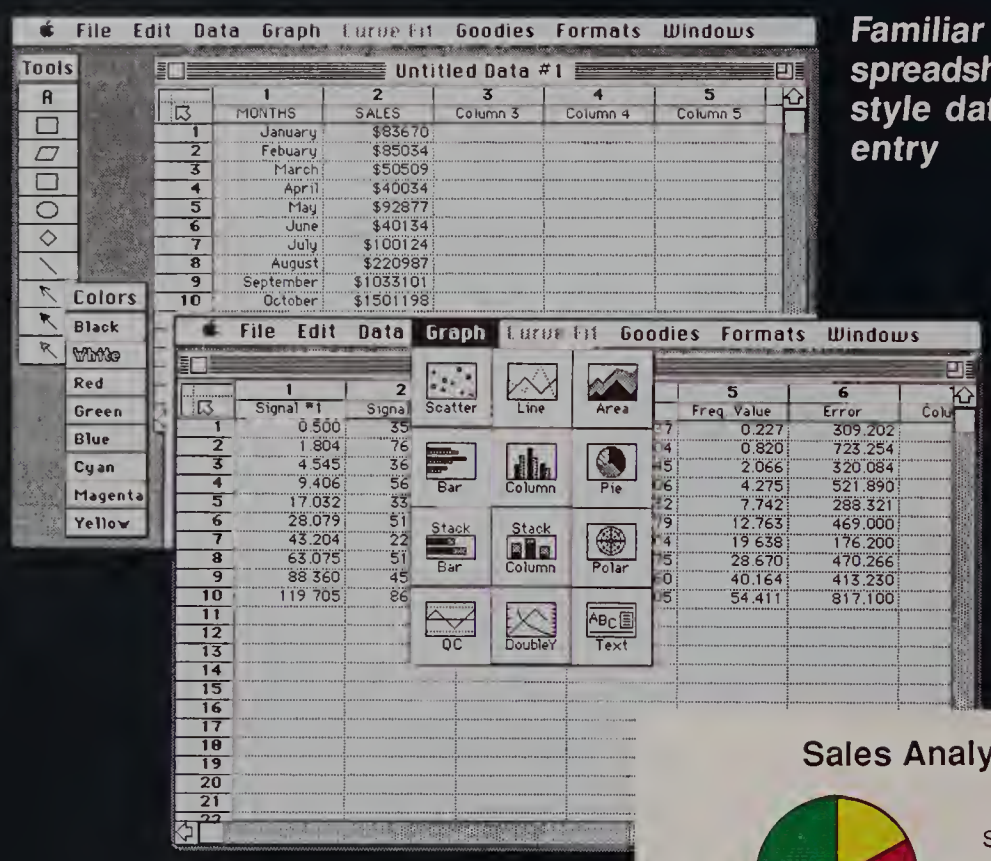
MW 1 88

cricket

GRAPH

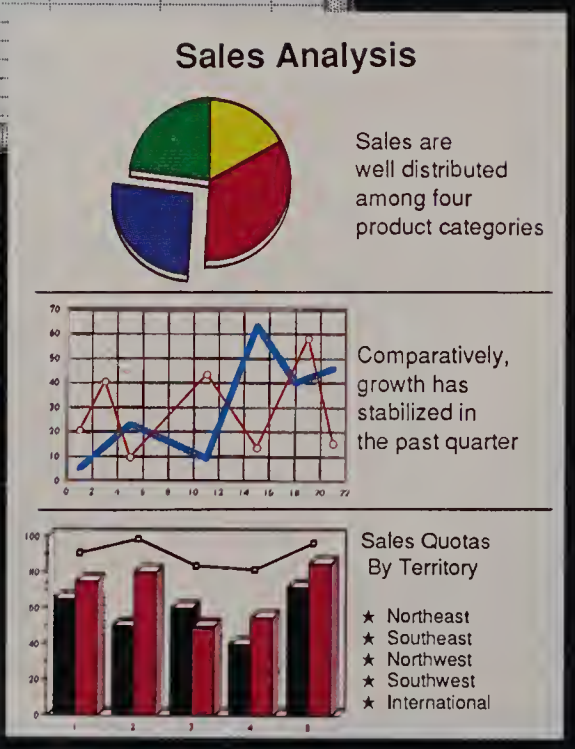
FIRST IN BUSINESS/ SCIENCE GRAPHING

New! Version 1.2 Features Improved Data Entry & Graphic Enhancement Tools



Familiar spreadsheet-style data entry

Choose from 12 different graphs and charts



Enhance graphs and create full page presentations

More than two years after its initial release, Cricket Graph still receives rave reviews. Why? Because Cricket Graph is THE Macintosh standard in business/ science graphing.

Elegance Defined

Powerful, yet easy-to-use — it's the measure of "elegance" in any software. Cricket Graph is elegance defined.

Data is entered in a simple, spreadsheet-like format, or it can be imported from many popular formats. Once the data is entered, you select from 12 different graphs and charts — Cricket Graph does the rest!

Full-Color Presentations

Cricket Graph gives you the ability to turn your graphs into dynamic, full-color presentations. You can place several graphs on a single page, add text and symbols, add color — even add three dimensional effects! When completed, you can print your results on a wide variety of devices with Cricket Device Drivers.



When it comes to Macintosh graphics software, there's just one name to remember — Cricket Software. Your local dealer will be happy to introduce you to the entire family: Cricket Graph, Cricket Draw, Cricket Presents. . ., and Cricket Device Drivers.

cricket software

Cricket Software, 30 Valley Stream Parkway, Great Valley Corporate Center, Malvern, PA 19355 (215) 251-9890

LaserWriter is a trademark of Apple Computer Inc. • Macintosh is a trademark of Apple Computer Inc.

Circle 384 on reader service card



MAC TO PC ELECTRONIC MAIL THEIR WAY.

MAC TO PC ELECTRONIC MAIL OUR WAY.

Next to InBox,™ the best way to send messages and files between MACs and IBM PCs is to walk. Or run. Or even fly. Because other electronic mail software is complicated, confusing, and in some cases, too stupid to tell the difference between a PC and a carrier pigeon.

InBox is different. In just minutes you'll be composing, sending, and routing messages and files to everyone in your group and other groups. Over an inexpensive AppleTalk network which can include MACs, PCs, and compatibles. From a simple phone message to detailed memos with attached files (like spreadsheets, MORE™ documents, letters, graphics, etc.), InBox lets groups or an entire company share information fast. So communication time goes down. And office productivity goes up.

THE CRITICS CHOICE

"As an actual user of the product, I am particularly excited about InBox."
John Sculley, Chairman and CEO, Apple Computer

"The world's best electronic mail system."
Andrew Seybold, President, Infonetics (industry analysts)

"Once you have InBox, you can't live without it."
Joseph Garappolo, Sr. Manager, Peat, Marwick, Main & Co.

Even if you're not at your desk or if your computer's off, messages, mail, and transferred files are waiting for you… delivery is virtually guaranteed. InBox can be the beginning of hyper-effective communications. And the end of paper messages and memos. Perhaps that's why InBox is the best seller and *MacUser Magazine's* "Editor's Choice." If you want instant communication between MACs and PCs, forget pigeons. Get InBox. It's the first electronic mail software that really flies.

Call 800-64-THINK today for more information.



THINK *A Division of Symantec*

THINK Technologies Division, 135 South Road, Bedford, MA 01730, 617-275-4800. Three user starter kit suggested retail price $350. MORE and InBox are trademarks of Symantec, Inc. © 1987 Symantec Corporation

Circle 96 on reader service card

File Edit Options Page Type Lines Shades

Beyo

Beyond words.

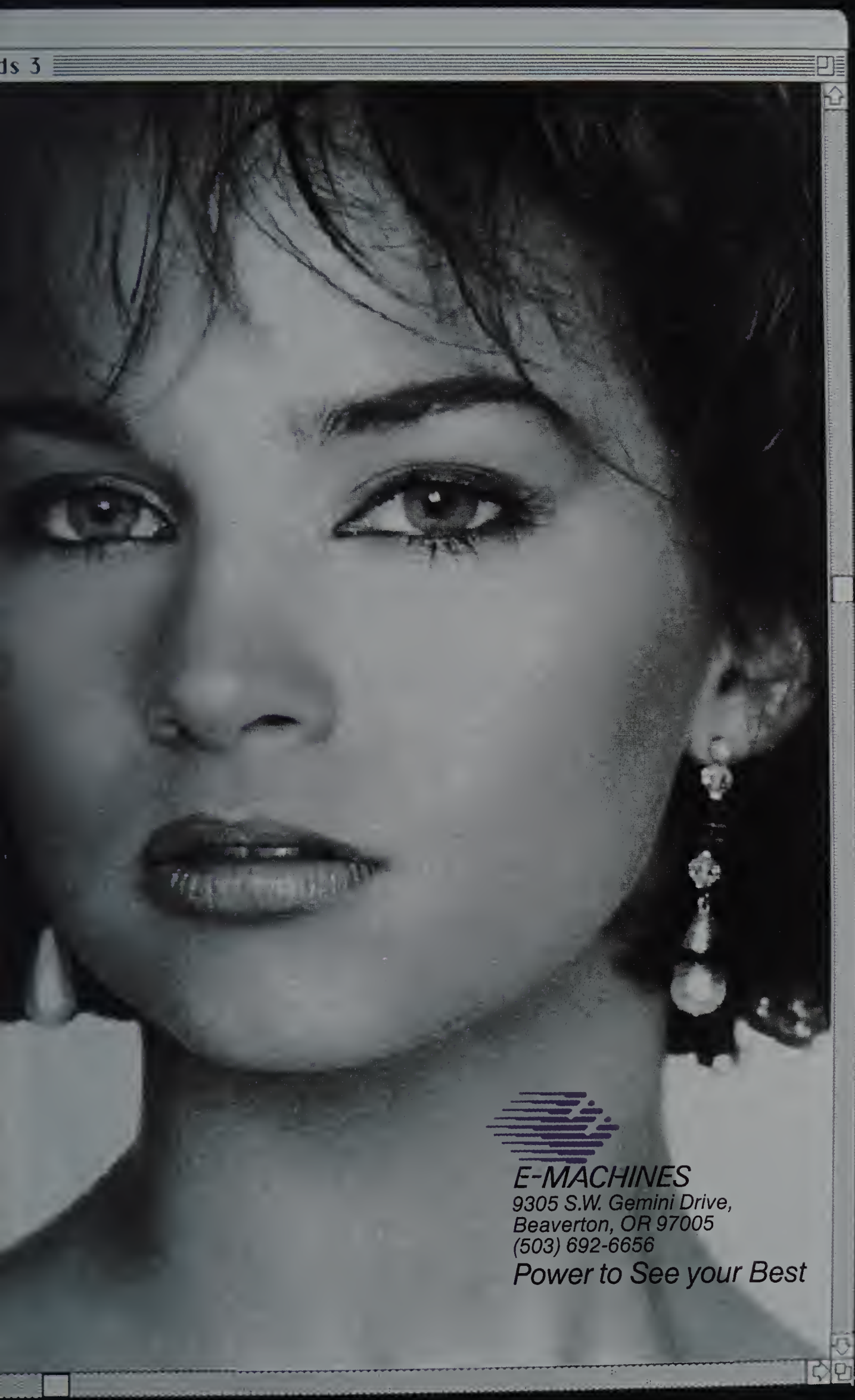
Introducing
***The Big Picture IQ*™**
Photographic Image Quality
Grey Scale Monitor

The Big Picture IQ shows your publication on the screen, with high-resolution images in place, ready for printing. Yet, *The Big Picture IQ* can still give you the words with all the crispness and contrast of a fine monochrome monitor, and at a price that's thousands less than large screen color displays.

Creative people have dreamed of this moment. Now it's here. See *The Big Picture IQ* for the Macintosh II at your E-Machines dealer today. It's beyond words.

L R 1 2 3 4 5

Actual unretouched photograph of The Big Picture IQ™ screen



Circle 600 on reader service card



THEIR INSTANT PRESENTATION.



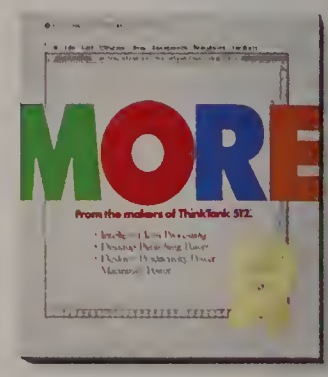
OUR INSTANT PRESENTATION.

If you're a busy manager who wants to look your best at a moment's notice, but don't have time to be an artist, there's only one choice. MORE. Because MORE is the only presentation software that turns ideas into presentations instantly. By doing all the art work for you using its built-in "graphic artist."

MORE is both an award winning outline processor *and* an instant presentation maker. So, for example, you can outline a new product sales plan right now. Then, when you need to present your time table, just click the mouse and that part of your outline becomes a perfectly spaced bullet chart. Want to add impact with shadowing and double lines or different type sizes and fonts? Click again. Or pick another part of the outline, click, and there's your organization chart. You can even print the entire outline and it's your sales meeting agenda. MORE is easy. Effective. And instant.

MORE outlining helps you get results fast. MORE presentations show off those results even faster. Maybe that's why MORE was named *MAC User's* product of the year. And why it's the best seller. Get more time to map out strategy and prepare for meetings. Get MORE. It's the fastest way to organize and build presentations. Beyond a shadow of a doubt.

For MORE information call 800-441-7234, in California 800-626-8847.



LIVING VIDEOTEXT
A Division of Symantec

Not copy protected. Suggested retail price $295. MORE is a trademark of Living Videotext, 117 Easy Street, Mountain View, CA 94043. © 1987, Living Videotext.

Mac Bulletin

Laser Envelopes

If you've ever tried to print envelopes on a laser printer, you know how their uneven surfaces and small size can cause spotty printing and misfeeds.

That's why James River Corporation is offering Laser Envelopes (distributed by Pro-Tech of Ludlow, Massachusetts). Each Laser Envelope, which holds a standard business letter, is folded so that the 11-inch preglued pocket and the open flap is 8½ by 11 inches in size, just like an ordinary sheet of paper. The flap is coated with glue that won't melt when it passes by the printer's heating element.

Since the flap of this envelope is not folded under the pocket during printing, you can print a message on the flap simultaneously with the front address.

Taking Off the Limits

A nationwide bulletin board system called Portal Communications, based in Cupertino, California, is offering unlimited access to Macintosh shareware, electronic mail, and private conferences for only $10 per month plus Telenet communication charges.

Portal also provides two-way access to Usenet, a distributed conference system spanning four continents and 30 countries, to tens of thousands of users. In addition, Portal connects to the UUCP, ARPANet, Bitnet, and CSNet networks, many of which are based at major universities where participants know a great deal about the Macintosh.

The community of Macintosh users is growing rapidly, as is the Macintosh BBS system, offering many downloadable files and message sections. Messages are organized much like the Macintosh Hierarchical File System, making it easy to find a specific topic. Portal also hosts nightly real-time conferences like the CB mode used in other services.

MS Write's like Word

Microsoft Write is a low-cost version of the Mac's most popular word processor–*Microsoft Word*. Listing at $175, it appeals to the more cost-conscious user or one who doesn't want to become involved in the complexity of a full-fledged word processor.

Actually, *MS Write*'s simplicity was relatively easy to come by–Microsoft just eliminated some of *Word*'s features until the program went down in size from 357,274 bytes to 292,657 bytes in the beta version. *MS Write* offers full compatibility with *Word*'s file format, in case users decide to opt for a $220 upgrade.

But *MS Write* is much more than a stripped-down version of *Word;* according to Microsoft, *MS Write* runs faster and provides more features than any other Macintosh word processing program in its price range. The program is also relatively easy to use, since it includes a context-sensitive help menu. *MS Write* comes with an integrated spelling checker, a page-preview function, and the ability to convert files to *Word, MacWrite, Microsoft Works,* and ASCII text.

A Mac II Mainframe Connection

Novell, the leading local area network (LAN) manufacturer–over 145,000 systems worldwide–now has a LAN that allows the Mac II to emulate popular IBM terminals while accessing a compatible mainframe. To link up to Novell's high-speed LAN, which runs on telephone cabling, you need only an interface board that plugs into a Mac II. The board contains a 10-MHz 80186 processor and 512K of zero-wait-state memory.

Requisite software includes an emulation program that allows you to maintain five concurrent host sessions and use a subset of MS-DOS functions, and a program that provides high-speed transfers of both binary and text files. Each of these products can be purchased separately, or the complete hardware and software package is available for $1315 from Novell's Communications Products Division, 1157 San Antonio Rd., Mountain View, CA 94043.

ScreenWars

Apple reportedly intends to challenge Adobe's Display PostScript with an upgraded version of QuickDraw, called NuGraph. NuGraph will send sophisticated screen-description commands to the Mac's video circuitry. Both screen-description languages should pave the way for a new generation of advanced graphics programs.

As of this writing, Adobe seems to be out in front as it writes code to use Display PostScript on the Macintosh, Sun, IBM Series 60, and NeXT computers. Apple is still defining NuGraph's capabilities. But the real battle will be fought behind closed corporate doors as Apple and Adobe woo software and hardware developers with their offerings.

Adobe is sure to herald the use of PostScript in many laser printers and the potential for using the same popular language for both screen and printer. Also, Adobe will offer one screen-description language for all major computers, eliminating the need to rewrite a major portion of a program for each piece of hardware.

Apple is expected to counter with NuGraph's reported ability to write to both screen and printer–so that (like Display PostScript) no translation will be necessary. But it could mean Apple's future printers

(continues)

will be incompatible with most current laser printers.

If enough developers sign up with both Adobe and Apple, then both products will enter the marketplace, where customers will make the ultimate decision about which screen-description language best meets their needs.

Wait for January

▶ An animated advertisement on disk from General Motors' Buick Division, called *Buick Dimension* and mentioned in November's *Mac Bulletin,* won't be available until late January. Many readers called the toll-free number we listed, only to find it disconnected. Everyone who left a name and address with Buick's corporate headquarters on instructions from local dealers will receive the first available disks for the 1988-model year. Otherwise, to get on the distribution list, send your name and address to: Buick Distribution Center, c/o Adcom Inc., 6845 Dix St., Detroit, MI 48209.

115 Pages of Programs

▶ Educomp's latest catalog of shareware, public domain, and demonstration software is a veritable encyclopedia of low-cost software, listing the contents of 361 disks in 115 pages. Besides ordering listed software, you can look up the function of programs seen on local bulletin boards.

For example, business offerings include stock market analysis, office management, and *Multiplan* and *Excel* templates. One educational program teaches that Halloween needn't be scary; another shows the placement of continents on a globe.

Other software available includes graphics, animation, sound and music, start-up sounds, productivity, clip art, *MacDraw* pictures, fonts, PostScript for the LaserWriter, word processing, desk accessories, function keys, communications, utilities, games, and programming.

Disk prices range from $3.00 to $8.50 per disk depending on the quantity ordered. To obtain a catalog, write Educomp Computer Services at 742 Genevieve, Ste. D, Solana Beach, CA 92075.

Faster Mac-to-PC Connection

▶ Most of the less expensive Mac-to-PC connections are based on the AppleTalk Personal Network, which operates at 237,000 bits per second (bps), about 40 times slower than the much more expensive Ethernet.

QuickShare, from Compatible Systems of Boulder, Colorado, is a new Mac-to-PC connection. This product, which operates at 1.6 million bps, is some 6 times faster than the AppleTalk Personal Network because it uses the Mac's high-speed SCSI port–an important benefit when many large files must be transferred between Mac and MS-DOS formats.

QuickShare gives the Mac user full access to the PC's hard disks, floppy disks, and local area networks. It can also transfer compatible files between Mac and MS-DOS programs, as well as capture text and graphics output from MS-DOS applications and input them into Mac page-layout packages.

QuickShare includes an internal board for an MS-DOS computer, a cable, and software. It works with the Mac 512KE, Plus, SE, and Mac II.

Mac II 300-dpi Color Printer

▶ Tektronix of Beaverton, Oregon, is offering a 300-dpi, four-color printer that prints any of 16.8 million colors and accepts QuickDraw output (a PostScript interface is under consideration).

Tektronix's Model 4693B parallel-input printer, available immediately, is priced at $7995 plus $495 for the Mac II interface card, cable, and software–considerably less than the PostScript-compatible QMS G650's expected price of $20,000 to $25,000.

Tektronix uses a thermal printer from an undisclosed Japanese company. This machine melts wax off a non-reuseable, four-color ribbon that will last for 275 copies. Each printed page costs 35 cents, and each overhead transparency costs $1.25. Output speed is one page per minute. The image processor contains a 16-MHz 68020 processor and 4 megabytes of RAM (expandable to 12MB for $4000).

Color correction is available from within the printer or through some of the Mac II's color paint and graphics programs. Tektronix's software includes a screen dump that can provide output for color matching in ten seconds. Image size is very close to 8½ by 11 inches when using an 8½-by-14-inch piece of paper.

Your Best Stacks

▶ Send a disk of your best *HyperCard* stacks to: News Editor, *Macworld,* 501 Second St., San Francisco, CA 94107. We'll pay $25 for every entry selected for a new monthly item, "Your Best Stacks." Please tell us how you developed your stack, describe its features and who would use it, and let us know how readers can obtain more information. We'll also need to know if it's free, shareware, or a commercial product.

Dueling Spreadsheets

▶ To challenge *Microsoft Excel,* Lotus is developing a Mac version of *1-2-3,* which has become a standard spreadsheet in the MS-DOS world; the program probably won't be ready until later this year.

Microsoft announced that it will update *Excel* to version 1.5 in the first quarter of 1988 with color for the Mac II; customizable menu bars and dialog boxes; and multitasking support for Apple's MultiFinder, which will allow the program to complete long calculations in the background while the Mac is used for other purposes.

A still later version of *Excel* will bring its functionality up to that of the MS-DOS version, which at press time was scheduled for release (November 1987). This later version will work with Microsoft's OS/2 operating system, which is a Mac-like, multitasking environment still under development. □

MacBottom Hard Disk Drives

The best gets better. Now our SCSI MacBottoms have a **2 year warranty** and are Macintosh II compatible! Choose from three models (HD21, HD32, HD45) and all are available with the optional MacBottom Modem. If you need an internal drive for your Macintosh II, our IHD144 is the answer. For 512K users we offer our MacBottom20 with serial interface. For details, call your dealer today.



MAC BOTTOM

Personal Computer Peripherals Corporation
6204 Benjamin Road • Tampa, Florida 33634
800-MACBUTT • 813-884-3092

©1987 Personal Computer Peripherals Corporation. MacBottom is a trademark of PCPC. Macintosh is a trademark of Apple Computer Inc.

Circle 729 on reader service card

For Macintosh Hard Disk 20 owners only!

If you own a Macintosh Hard Disk 20 with the external floppy drive interface you can now take full advantage of the Macintosh II, Plus and SE high speed SCSI port with PCPC's *HD-20 WSI (With SCSI Interface)* upgrade.

The PCPC *HD-20 WSI* provides a SCSI interface for *your* Macintosh Hard Disk 20 via an easy-to-install upgrade. In addition to a performance increase of 6 to 10 times and the ability to daisy chain up to seven SCSI peripherals, we provide a fantastic compliment of software, including HFS Backup, PCPC's popular archive and restore utility; Eureka!, the file finding desk accessory; and our ImageWriter and Laser spoolers.

The *HD-20 WSI* consists of a plug-in circuit board, interface cable, and utility software. It is designed for easy installation, as the circuit board uses the existing plug-in connectors and requires no soldering.

With PCPC's *HD-20 WSI* you can take full advantage of the power built into your Macintosh. The *HD-20 WSI* has a 1 year limited warranty and is priced at $295.00. Don't let your hard disk be the weak link of your system, order your WSI today!

Personal Computer Peripherals Corp.
6204 Benjamin Road, Tampa, Florida 33634
(813) 884-3092 (800) 622-2888

© 1987 Personal Computer Peripherals Corporation. HFS Backup and HD-20 WSI are trademarks of PCPC. Macintosh is a trademark of Apple Computer, Inc.

Circle 223 on reader service card

Sometimes A Picture Is Worth A Thousand Words.

It hasn't taken the desktop publishing world long to get the picture with scanners.

Literally overnight, people who haven't drawn anything but a paycheck since grade school have



been able to generate crisp, professional documents with first-rate photographs, illustrations, logos, and other graphics.

Our own PC Scan™ scanners are able to input images into your Macintosh™ Plus, Macintosh SE, Macintosh II, IBM® or compatible PC in seconds, and size and scale the image in the process. Then, with the help of Super Paint™ or PC Paintbrush™ Plus image editing software, you can annotate, crop and embellish images and ultimately transfer them into your desktop publishing program.



Likewise with photos. Up to 256 levels of true grey scale data may be scanned, providing unsurpassed image quality. And the printouts are stunning, translating photos into high-quality images which can then be printed on digital phototypesetters or laser printers right on your desktop.

PICTURES ARE JUST
PART OF THE PICTURE.

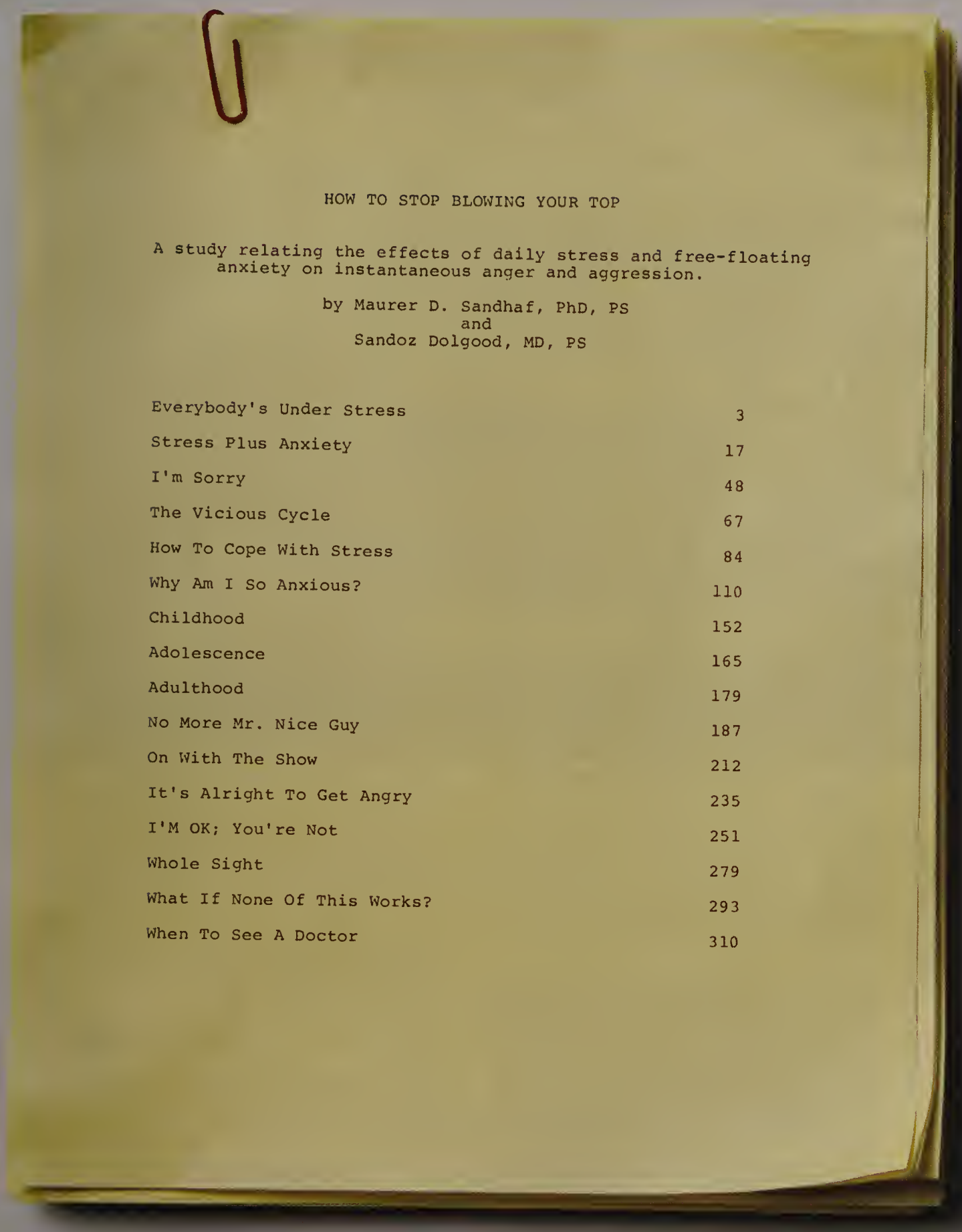
We also scan words. Which happen to account for 80% of most documents.

And when you think about it, that may be an even more valuable asset than our ability to input graphics.

How do you currently enter existing documents into your system? Retype them, right? At 60 or so words a minute?

That's an incredible time drain when you consider that with our PC Scan family, you can scan

Then Again, Sometimes A Thousand Words Are Better.



HOW TO STOP BLOWING YOUR TOP

A study relating the effects of daily stress and free-floating anxiety on instantaneous anger and aggression.

by Maurer D. Sandhaf, PhD, PS
and
Sandoz Dolgood, MD, PS

Everybody's Under Stress	3
Stress Plus Anxiety	17
I'm Sorry	48
The Vicious Cycle	67
How To Cope With Stress	84
Why Am I So Anxious?	110
Childhood	152
Adolescence	165
Adulthood	179
No More Mr. Nice Guy	187
On With The Show	212
It's Alright To Get Angry	235
I'M OK; You're Not	251
Whole Sight	279
What If None Of This Works?	293
When To See A Doctor	310

an entire page of existing text in the mind-boggling time of 25 seconds, average. We read 600 words a minute.

And those words will appear on your screen the same way they do on the page. With the same tabs, same indents, same underlines, same everything.

Then you can take those words, edit them, change their order, fiddle around with the syntax and add your own information.

And then transfer everything into your desktop program and start publishing.

Our desktop scanners read more business fonts faster than any other scanner. Including first-pass dot matrix, laser and daisy wheel.

And they're a snap to use, too. One lone keystroke begins operation instead of the multi-stroke formulas many scanners require.

WE WEREN'T BORN YESTERDAY.

Although desktop publishing is a relatively new phenomenon, we're not exactly neophytes when it comes to desktop scanning.



For the better part of two decades, we've been producing the leading line of scanners for word processing systems.

A background that leaves us uniquely and enviably situated to equal our success in desktop publishing.

If you'd like more information on our desktop scanners, call 800-538-7582 outside California. Or 408-946-7100 inside California.

We'd love to share a few words with you. Not to mention pictures.

DEST

© 1987, DEST Corporation. PC Scan is a trademark of DEST Corporation (not to be confused with PC Scanner, a trademark of Caere Corporation). Other names indicated by ™ or ® are trademarks and/or tradenames of their respective manufacturers.

Circle 615 on reader service card

new VERSION 1.1

THE NEW YORK TIMES:

"MicroPhone is a breakthrough in communications software…"

LOS ANGELES TIMES:

"The program is more sophisticated and easier to use than any…on either the PC or the Mac."

MACWORLD:

"…brings together the best traits of every Mac communications program."

INFOWORLD:

"MicroPhone is the easiest communications package we've seen."

With reviews like these who needs advertising?

They say the best advertising is word of mouth. So we're reprinting some of the multitude of words that have already been said about MicroPhone communications software for the Macintosh.

And what they're saying, universally, is that MicroPhone—created by Dennis Brothers—has far outdistanced all its predecessors. That for the novice, MicroPhone is the simplest telecom software ever devised. That for the expert, MicroPhone is the most powerful.

On-line for the lazy.

MicroPhone gives you the means to create infinitely elaborate macro (automated) routines with infinite simplicity. Its powerful script language is written in plain English, and it also features a recording mode that watches, saves, and repeats what you do. So no programming skills are required.

The upshot is that MicroPhone will save you time, hassle, and on-line fees by automating virtually every operation you now have to key by hand. Log on procedures. File transfers. And, for a good example, E-mail retrieval routines.

At a single command from you, MicroPhone will dial your E-mail service, give your ID number and password. Navigate its way through the labyrinth to your mailbox. Check for mail. Log off if there is none. And if there is, MicroPhone will collect, print, and save all messages to your disk. Then, politely log off.

If you prefer, you can direct MicroPhone to initiate this sequence simply by inserting the disk. Or automatically, at any specified time, day, night. Or at regular intervals.

Anything else you need to do, from collecting stock quotes to sending and receiving files, is just as simple.

Try it out at home or office.

You can find out firsthand just what a remarkable program MicroPhone is. Without risking a cent. We give you a thirty-day moneyback guarantee, no questions asked. Which is virtually unprecedented in software.

Since MicroPhone is not copy protected, we obviously have vast confidence both in our program. And in you.

Let's get technical box.

- *50 to 57,600 Baud*
- *Supports XMODEM*
  - *YMODEM*
  - *ASCII*
  - *1K BLOCKS*
  - *MACBINARY*
  - *MACTERMINAL 1.1*
- *Emulates TTY*
  - *VT52*
  - *VT100*
- *Capture file On/Off*
- *Printer On/Off*
- *Auto log on scripts for information utilities provided*
- *Scripts Invoked by*
  - *Button*
  - *Menu*
  - *Command Key*
- *Scripts have full logic constructs*
- *Works with ALL Macintosh models & LaserWriter*
- *Works with all async modems (Hayes included)*
- *Includes Switcher & CompuServe subscription*
- *Includes text editor licensed from Dreams of the Phoenix Inc.*
- *Documentation by Neil Shapiro*

MicroPhone™

Communications Software for the Macintosh



MacUser Editor's Choice Award

MicroPhone is a trademark of Software Ventures Corporation © 1986, 1987 Software Ventures Corporation

SOFTWARE™ VENTURES

2907 Claremont Avenue Suite 220 Berkeley, CA 94705 415-644-3232

Circle 625 on reader service card

David Bunnell

The Second Coming of Steve Jobs



Steve Jobs-bashing is in vogue. And Jobs has turned into the Trotsky of high-tech. Grow up, everyone.

The Macintosh is four years old this month, or perhaps I should say four light-years old. We have seen galactic changes in the Macintosh universe since it was first introduced in Cupertino, California, on January 24, 1984, at Apple's annual stockholders' meeting.

I'll never forget the intense euphoria of that night. Inside the packed auditorium at De Anza College, it felt more like a rock 'n' roll revival–as if the Beatles were getting back together again–than a stockholders' gathering.

People were cheering as Apple co-founder Steve Jobs and Apple chief executive John Sculley made their presentations. Then Steve stepped up to the Mac, unzipped the case, turned on the machine, and it spoke to the audience: "Hello, I am Macintosh." Everyone went completely wild.

Macworld spoke that night, too. We were there with the first issue of the magazine. We had been working behind the scenes with Apple for over six months to create *Macworld* magazine. Here was our reward; we passed out thousands of copies to the frenzied audience.

Now the machine was the subject of a magazine "for the rest of us."

Lately, there's been a great deal of looking back at that early period when the Macintosh changed the face of personal computing forever.

There has been a deluge of articles on the subject, along with books like John Sculley's *Odyssey: Pepsi to Apple–A Journey of Adventure, Ideas and the Future* (Harper & Row, 1987), Lee Butcher's *Accidental Millionaire: The Rise and Fall of Steve Jobs at Apple Computer* (Paragon House, 1987), and most recently, the highly readable and fascinating *Steve Jobs: The Journey Is the Reward,* by Jeffrey S. Young (Scott Foresman & Co., 1987).

Most of the press has not been very kind to the man who was the driving force behind the Macintosh. There's been a wave of Steve Jobs-bashing and gloating over his corporate downfall from Apple. In a sense, Jobs has become the Trotsky of high-tech, the foremost ideological outcast of Silicon Valley.

Perhaps our culture, with its *People* magazine mentality, typically lionizes its heroes, then eats them alive. It's part of the food-chain of fame, I suppose. But it sticks in my throat nonetheless.

For example, in *Accidental Millionaire* Butcher (an appropriate name, by the way) writes that "the Macintosh was the first attempt Jobs had at creating a computer and it was a failure."

This cold and untrue statement smacks of historical revisionism at its worst. Even if the original Macintosh was not perfectly executed, it did, beyond any question, set the course for computing in the future–for all personal computing.

If you don't believe me, just look at MS-DOS machines today. You will see pull-down menus, *Windows* software, and icons, not to mention mouse pointing-devices.

When Apple introduced the Macintosh, there was a definite shift in innovation from IBM back to Apple. Earlier, when Apple was still riding high with its popular Apple II computer, IBM brought out its 16-bit PC and stole the thunder from the 8-bit Apple machine. The IBM PC offered more memory, and it had more speed and power. It set new standards for the industry.

Then, Apple introduced the Macintosh at about the same time that IBM brought out its ill-fated PCjr with its Chiclet-style

(continues)


Ultrasync.
You're looking at the new star
in display technology.
Actual unretouched screen image.

A screen star is born.

Introducing Ultrasync. The high-resolution, autosynchronous color monitor that's PC and PS/2 series compatible.

Ultrasync, with its exceptionally fine (.28mm) dot pitch, creates a picture of incomparable clarity. Capable of displaying infinite shades of brilliant color with striking contrast and dimension.

But the real beauty of Ultrasync is its versatility. It has the greatest autosynchronizing frequency range combination available with 45Hz to 120Hz vertical scan range (NEC's Multisync starts at 50Hz and peaks out at 75Hz) and 15KHz to 35KHz horizontal scan.

Plug Ultrasync into any IBM PC/PS series, Apple Mac II, or practically any computer system and it will adjust automatically to the standard you are using. There's no fiddling with switches or knobs. Our automatic picture sizing feature prevents display distortion and shrinkage. A simple built-in text switch is provided for your convenience. What's more, you'll enjoy the ease and comfort of Ultrasync's ergonomically advanced design.

Nobody but Princeton Graphic Systems could bring you an image with such star quality at a suggested retail price that's remarkably affordable. $795. After all, we've been doing it all along.



PRINCETON®
GRAPHIC SYSTEMS
THE VISIBLE EDGE

601 Ewing Street, Building A, Princeton, New Jersey 08540 (609) 683-1660

Circle 656 on reader service card

keyboard. The entire industry perception of personal computing changed once again, in favor of Apple. I firmly believe that this historical shift was the basis for Apple's tremendous performance in the market today. It also remains the foundation for the company's continued success.

Certainly, there were mistakes and miscalculations involved in the marketing and design of the Macintosh. But in no way is the Mac a failure, as Butcher alleges.

Steve Jobs told me he expected to sell 750,000 machines in 1984. It turned out that only 250,000 Macs were sold that year. Even so, this was an incredibly successful sales figure for a brand-new machine, with a totally different operating system, in a market dominated by IBM PCs and clones.

Among the Macintosh's winning features were its small footprint, its carrying case, and its graphics interface. I think those were all brilliant strokes. Even the machine's closed operating system, although it's been severely criticized, was not really an unreasonable idea–at least as far as Apple was concerned.

The Mac's architecture was designed so that all the software written for it would be standard. Developers wouldn't have to worry about multiple printers and various configurations the way they do in the MS-DOS world. Apple had put so much code into the ROM that it was impossible to clone the Mac the way MS-DOS machines were cloned.

In this way, Apple has been able to maintain better control over its machines. More important, it's been possible for Apple to keep prices high and retain better margins. That's only good business sense.

I was also a big fan of the fact that the Macintosh had no fan. A lot of criticism has been leveled at Jobs for not putting a cooling fan into the Mac. But I think that the ability to sit quietly with a computer that doesn't make a loud humming and rattling noise is a definite plus. It allows you to think more clearly and to be much more creative.

Just prior to the release of the original Mac, Andrew Fluegelman, founding editor of *Macworld,* wrote a memo that was widely circulated in the Macintosh division at Apple. In it, Fluegelman urged Apple not to bring out a 128K machine. He recommended waiting until the company was able to release a 512K Mac. Ultimately, as you may recall, Apple opted to unveil the 128K model.

Why didn't Apple bring out a 512K machine at the start? It required larger memory chips. And although the chips existed, they were not available in volume at a price that made sense at the time.

I think there was tremendous pressure on Apple to get the Mac out in time for its annual stockholders' meeting. Apple was so obsessed with turning that event into a major launch for its new product that it probably did itself a disservice by coming out with the 128K model.

In my opinion, the most serious mistake Steve Jobs ever made with the Mac was not in the actual design of the machine. The Mac's Achilles' heel was that it lacked the necessary third-party software support. It was not a technology problem but a personality problem. Jobs was so abrasive that he tended to alienate people–especially the software developers whom he desperately needed to woo.

At the original Macintosh launch, Fred Gibbons, president of Software Publishing, Bill Gates, chairman of Microsoft Corporation, and Mitch Kapor, president of Lotus Development Corporation, all stepped forward to announce that their companies would support the Macintosh with software. Of the three, only Bill Gates actually came through. In fact, he had several programs ready on opening day.

Software Publishing quickly abandoned the Mac. And it took more than a year before Lotus came out with *Jazz,* a program that proved to be a dismal failure.

By contrast, I think that one of the most positive achievements of Apple chairman John Sculley in the post-Jobs era is that he has taken great pains to mend broken fences. He has carefully built good relationships with the infrastructure of the personal computing world. Not just with the third-party software companies, but also with dealers, suppliers, journalists –the entire personal computing community, in fact.

Remember, there were and are a lot of people in the personal computer industry hoping that Apple would succeed with the Macintosh. The truth of the matter is that many industry leaders feared that IBM would come to own all of personal computing.

My friend Dr. Eddie Currie, president of the New York-based software company Lifeboat Associates, made dire predictions about Big Blue at the time. With the introduction of the IBM PC, he warned, personal computing had gone into orbit around IBM. "It's not clear if we'll ever have the velocity to escape that orbit," he worried.

One fear was that Big Blue was strong enough to kill any of its competitors. There was an added danger that innovation could easily be stifled, because no one would dare do anything that wasn't done the IBM way.

Furthermore, IBM was selling directly to many of its corporate accounts, a fact that gave dealers the jitters. Once IBM controlled the software, they reasoned, it would then control everything–including the kitchen sink and all its peripherals.

So there was a genuine receptivity to Apple. But Steve Jobs failed to capitalize on that ground swell of popular support.

Jobs's second biggest mistake was alienating the Apple II division by doing some really dumb things. For example, at the annual stockholders' meetings in 1984 and 1985, staff from the Macintosh division sat in the front rows while people in the Apple II division had to watch on closed circuit TV in another building.

Jobs passed over achievements of the Apple II team, even though Apple II sales were growing astronomically. They were actually bringing in all the company's profits.

Another mistake Apple made with the Mac was introducing it at too high a price. The 128K Mac sold for $2495. This meant that the first wave of buyers were not the "rest of us," as Apple's advertising proclaimed. Rather, they were the personal computing enthusiasts who already owned three or four machines. They were the early adapters–always keen on acquiring the newest, the greatest, the latest thing. Definitely a small niche market.

I don't know what the price-per-unit cost was to market the Mac, but I feel certain that if the product had been priced at $1995, Apple would have sold 750,000 units that first year instead of only 250,000. And the Macintosh would really have quickly become the machine "for the rest of us."

But a lot has happened since 1984. As the Macintosh goes into its fifth year, I see only good things ahead for Apple.

We're seeing a tremendous amount of innovative software emerging. Desktop publishing is booming. We're witnessing great CAD/CAM applications, as well as new and really good database products for the Mac.

I expect we'll see much more Mac technology develop in 1988–especially connectivity solutions, and more communications.

(continues)

NODE WARRIORS.



For many people, using their Local Area Network is like a journey across 500 miles of bad desert, with strange, unforeseen forces of destruction lurking behind every turn.

Until now that is.

Because now there's TOPS, a revolutionary departure in LAN design. TOPS fully arms each node with local user control of information, and frees you from the grips of costly central file servers—and even more costly network administration personnel.

TOPS' unique design gives users completely transparent access to files anywhere from any operating system on any computer—anywhere in the network. And TOPS' modular design supports new operating systems as they become available. Users become believers, because TOPS is so easy to operate. All its commands are totally intuitive.

TOPS is also easy to install and support, and there's no downtime necessary when adding new users. You just plug them in. And because there's no central file server you avoid data crashes and bottlenecks. Your LAN will be stronger than ever, and faster too, because users communicate directly with each other.

Reinforcements!

TOPS Version 2.0 does everything the original does, then adds a few extras all its own. Like automatic publishing and mounting of folders and volumes. Access to locally attached PC printers by other networked PC users. Compatibility with Apple Filing Protocol, and FlashTalk™ speed (it's three times faster than AppleTalk in PC to PC communications). Translation of PC files to Mac format and vice versa. And a lot more.

And price? No need to worry, because it won't put you into deficit spending. TOPS is just $189 per node for Macintoshes and PCs.

So call 800-222-TOPS (US), 800-445-TOPS (CA), for a free Node Warrior button and more information. It'll tip the balance of power in your direction.

TOPS®

A Sun Microsystems Company

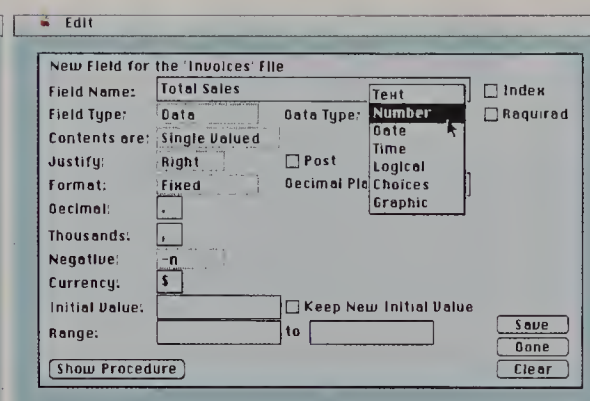
2560 Ninth Street, Berkeley, CA 94710

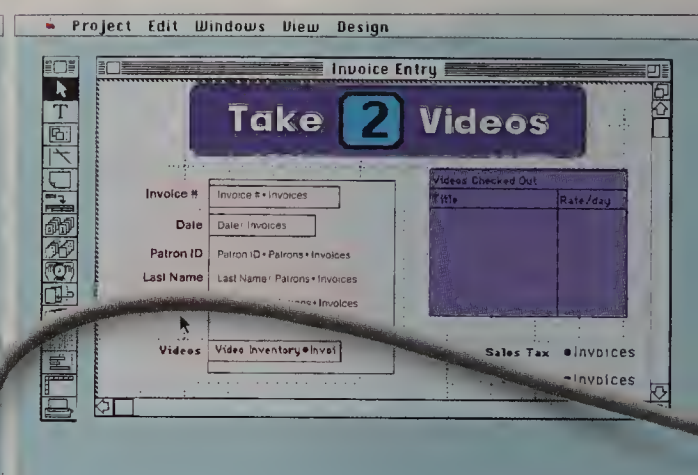
Registered trademark: TOPS, Sun Microsystems, Inc.
Trademarks: FlashTalk, Sun Microsystems, Inc; AppleTalk, Macintosh, Apple Computer, Inc.

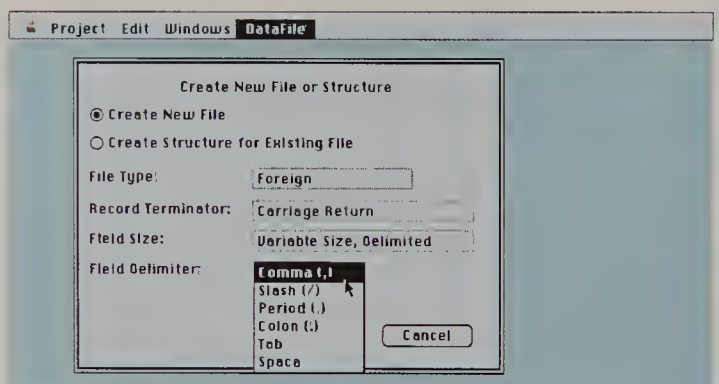
Circle 524 on reader service card

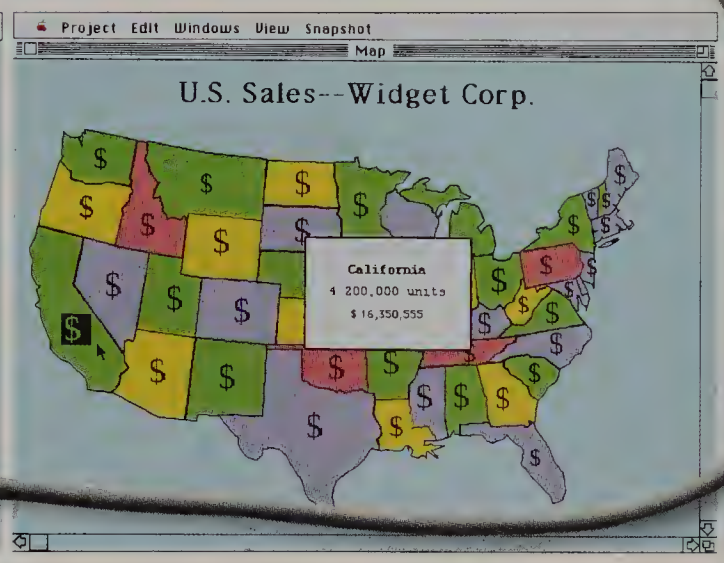
Ashton-Tate ann
powerful database ever

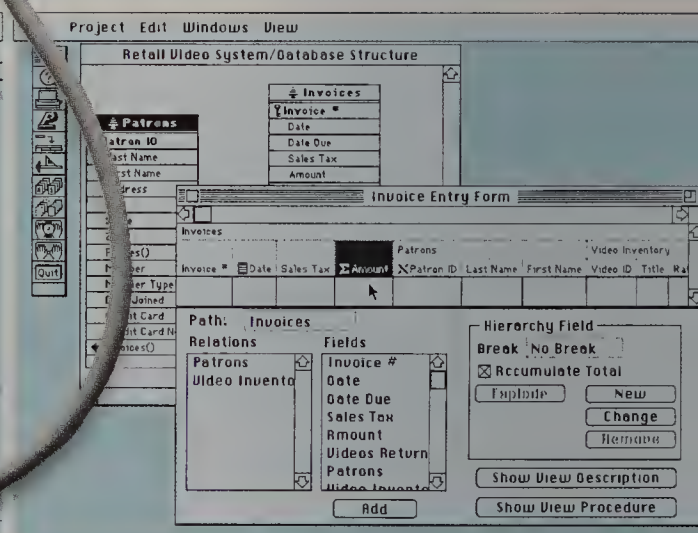


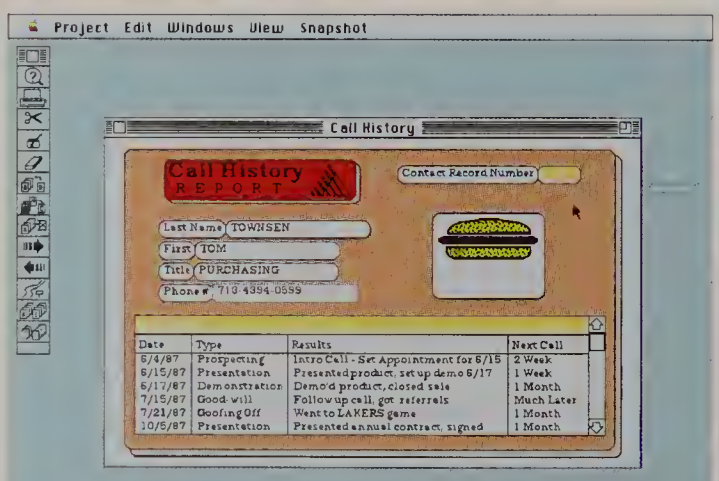


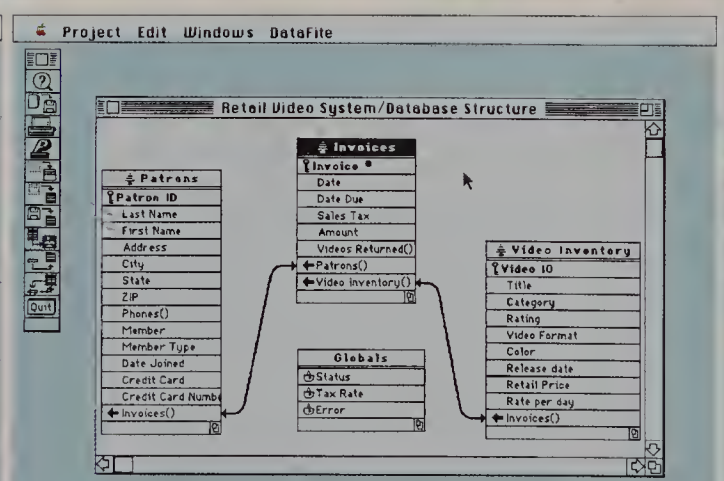


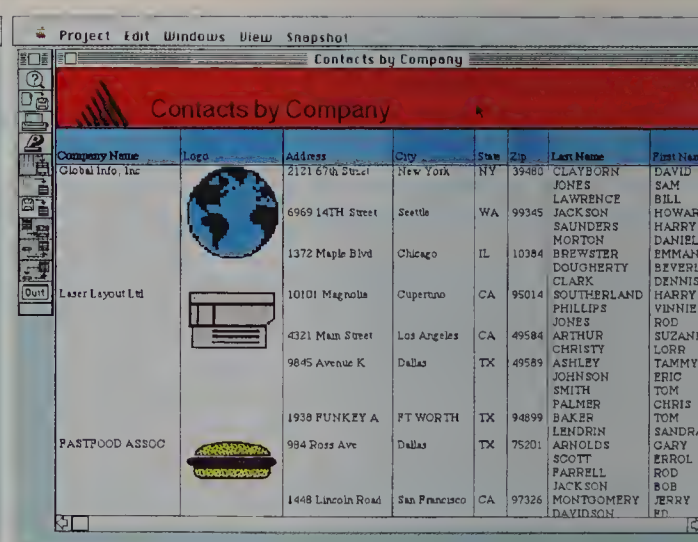


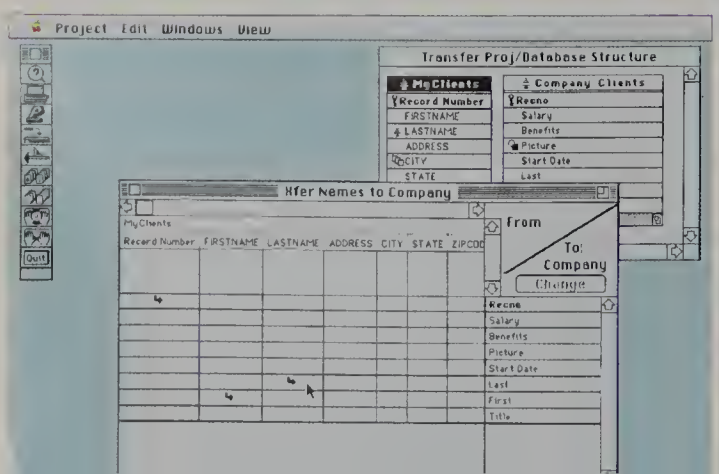


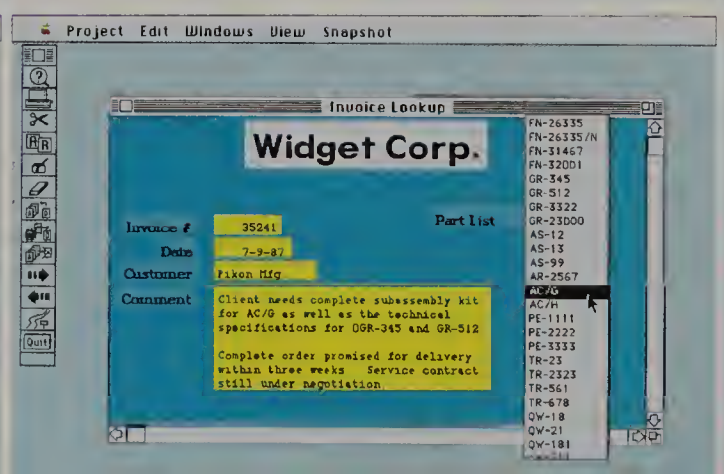


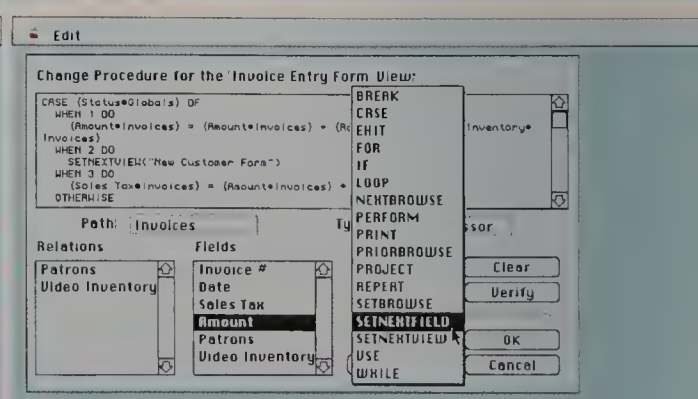












ounces the most used by man or mouse.

It's called dBASE® Mac.

And it's the most powerful relational database designed for the Macintosh.™

Especially since, unlike other databases, you can get that power without knowing a thing about programming.



Begin by creating and relating your files. Not just linking them, but relating them. So when you update one file, all your related files will be updated. Automatically. Immediately.

And remember, with dBASE Mac you can do all this without programming.

With a few clicks of your mouse, you can quickly redesign and rearrange your files to look at your data in any number of ways. Without disrupting it.

And without any programming.

Also using the selection of fonts and MacDraw®-like tools, you can design reports from the very simple to the very sophisticated. Right on the screen. So you'll know how it looks before you print it.

We're not talking about just text and graphics. With dBASE Mac, you can incorporate photos of people, parts and places into your database.

You can even import data from Ashton-Tate's dBASE III PLUS,™ dBASE III,® or dBASE II,® as well as ASCII files.

All without programming.

And all with the help of Macintosh's on-screen prompts and pull-down menus.

But if you want to go still deeper, the powerful dBASE Mac programming language will take you into a world of power and capability where no Macintosh has ever gone before.

If you would like a demo disk for $4.95,* or the name of the dealer nearest you, call (800) 437-4329, extension 2400.** You'll see how this Ashton-Tate relational database will make your Macintosh office work smarter.

Whether you are a huge organization.

Or a one-mouse shop.



ASHTON·TATE®

*While supplies last. **In Colorado, call (303) 799-4900, Extension 2400. Trademarks/owner: dBASE, dBASE II, dBASE III, dBASE III PLUS, Ashton-Tate/Ashton-Tate Corporation; MacDraw/Macintosh/Apple Computer Inc. ©1987 Ashton-Tate Corporation. All rights reserved.

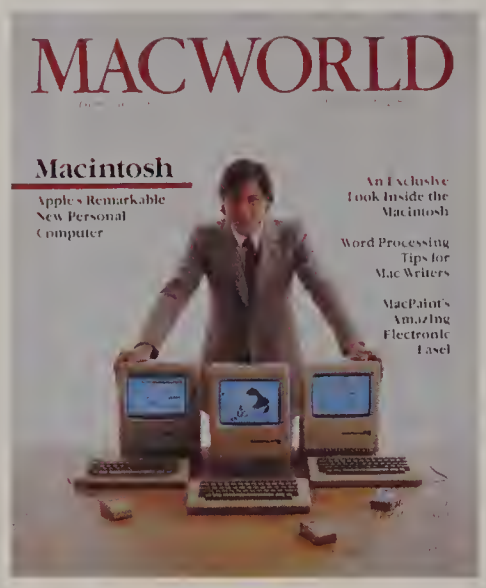
Circle 797 on reader service card

David Bunnell

'Mac-Type People'

Steve Jobs kept changing his mind about appearing on *Macworld*'s first cover. Finally, we got him to pose for 30 seconds. Later, he had us change the images on all the screens of the Macs. Then he called to say he didn't want to be on the cover after all. We told him it was too late and the issue was already at the printer's, which, of course, it wasn't.

We had set up a secret office inside the *PC World* building to work on *Macworld*. We took over the conference room and papered over the windows so that no one could look inside. And we put special locks on the doors. Inside this operations room, we had a team of five *Macworld* staffers working away on two 128K machines. It



was a six-month project that culminated in the release of the magazine at Apple Computer's annual stockholders' meeting on January 24, 1984–the night that the Macintosh was launched.

Winning Apple's trust and confidence was a close call for *Macworld*. Andrew Fluegelman, the magazine's founding editor, and I visited Apple to make a pitch to publish a Macintosh-specific magazine. We weren't the only ones to make a proposal. Our competition had been there earlier with an elaborate presentation–charts and graphs and slides, and all kinds of pizzazz. But Steve Jobs and Mike Murray, marketing director of Apple's Macintosh division, picked us to create a magazine for what we knew would be a large and passionate audience of Macintosh users. We were "Mac-type people," they said. We took that as a high compliment then, and we still do.

My fondest wish for 1988, though, is that John Sculley, Apple, and Steve Jobs will bury the hatchet.

We've had enough Steve-bashing. I say, give the guy a break. It's difficult to imagine anyone going through so many changes, and becoming so powerful so fast, without having to make some basic character adjustments.

All that Steve really needs to do in order to answer his critics–and what he's likely to do this year–is to bring out his new NeXT computer. I think it will probably set new standards, new directions, and new trends for personal workstations.

Steve Jobs is a technological innovator and an implementer. His greatest skill is not inventing new technology. We're all aware of his shortcomings as an engineer. So what? His gift is finding existing technologies and integrating them in a new package that becomes easily accessible to the widest number of users.

Ultimately, he has been the catalyst for changing the direction of personal computing.

The mouse, *Windows,* pull-down menus, and the graphics interface were invented at Xerox PARC. Steve Jobs and Apple did not invent them. But it was Steve Jobs and Apple that made them what they are today. If Steve hadn't reached out and grabbed those ideas, they would have withered away in some R&D lab, just so many useless and unused experiments.

I suspect that at NeXT, Steve will bring in some components and technologies that we haven't seen packaged before in personal computers. As usual, he will probably do that in interesting ways that will raise the stakes of personal computing.

Some industry insiders have sarcastically predicted that the NeXT machine will be a "super-yuppie machine" with great graphics and sounds, and that's all. Whatever it may be, I look forward to it with great eagerness. Because I will wager that when the NeXT workstation does come out, suddenly people will be amazed by Steve Jobs all over again. The fickle media will become more sympathetic, and they'll start to build him back up to his former glory. Perhaps no longer as a wunderkind, but a wundermensch.

I hope that from all this turmoil a new Steve Jobs will emerge–a more grown-up and diplomatic person. We may actually witness his second coming in 1988. But I don't think that this triumph means he is going to eclipse Apple. Apple will continue to be successful, huge, and magnificent. Steve will be a winner in his own right.

Jobs's critics may truthfully declare that Sun Microsystems and Apollo Computer invented the workstation, that they laid all the technological groundwork. But Steve Jobs will be the one who plays a major role in making workstations popular and accessible for the rest of us.

He will be the Merlin who gives workstations imagination and transforms them into the machines of the nineties and beyond.

Rest assured, Steve Jobs will be back one day soon. We still need him. He still needs us.

Have an insanely great 1988! □



"Can you believe it? Our team got picked for the hottest project of the year because they found out we do all our work on Sony diskettes."

The fast-moving, fast-thinking people in today's competitive corporate world are the people pushing for the highest standards. For example, Sony diskettes.

People in the know, know that Sony's standards are the very highest. That, after all, is what made Sony a world leader in audio, video and computer magnetic storage media.

But selecting Sony also shows solid business sense because we invented the revolutionary format for the 3.5" drive and 3.5" floppy.

So we simply have much more experience than anyone else at making and perfecting 3.5" floppy disks.



Think of it this way: when your reputation's on the line and you've put your very best into your work, you want to be sure that your floppies are every bit as good as you are.

The way to do that is to make sure they're Sony.

Then you'll be in the very best of company.

SONY®
THE ONE AND ONLY®

© 1987 Sony Corporation of America. Sony and The One and Only are trademarks of Sony

Circle 210 on reader service card


WordPerfect
for the Macintosh

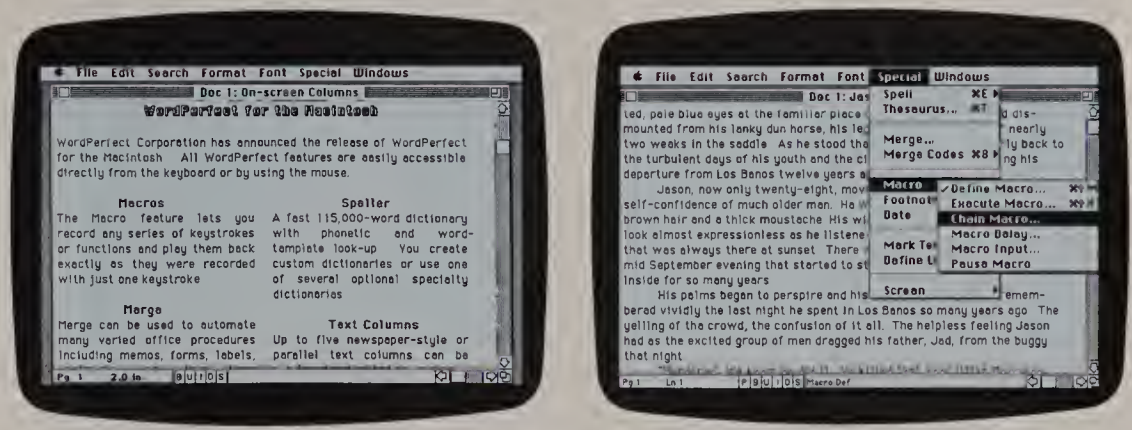
WordPerfect's new arrival that wasn't born yesterday.

WordPerfect for the Macintosh has just arrived, and with it comes a whole new era in word processing for the Mac.

Yes, it was a long time coming. But a sophisticated word processor



doesn't just drop from the skies. It takes time. Time to create a true Mac mouse interface that also has the built-in versatility of keystroke equivalents in main menus and submenus. Time to implement exclusive WordPerfect features such as on-screen text columns,



(Left) Create up to 24 on-screen text columns, with snaking or screen-writer column options. Put them anywhere in your document, any time you like. (Right) Store the tasks you do frequently—with no limit to number or size—and call them up instantly via mouse or simple keystroke commands.

automatic formatting, document compatibility, a fully integrated thesaurus, and a dictionary that's 115,000 words strong.



Check out our great new arrival. The proud culmination of painstaking research and responsiveness to user needs. The only serious word processing software that's truly fit for a Mac. For more information call or write WordPerfect Corp., 288 West Center St., Orem, Utah 84057 (801) 225-5000.

WordPerfect
CORPORATION

WordPerfect® for the Macintosh®.

Circle 40 on reader service card



World's Most Complete 2400 Baud Multi Speed Modems for Apple® Computers.

External and Internal

2400 Baud Internal Modems

- Macintosh™ II . . . . . Epic 2400 II
- Macintosh SE . . . . . Epic 2400 I
- Apple II+, IIe, IIGS . . . . . Epic 2400 Classic

2400 Baud External Modems

- Compatible with any Computer's . . . Epic 2400 Plus modem/serial port

Epic

1-800-634-9992

EPIC TECHNOLOGY, Inc. 46733 Fremont Blvd., Fremont, CA 94538 In California: 415-683-0932 FAX 415-683-0935

Apple®, Apple II™ and Macintosh™ are registered Trademarks of Apple Computer Inc.
©1987 Epic Technology, Inc.

Circle 612 on reader service card

Letters

A forum for Macworld readers

Cattle Call
Cattle ranching, like all agriculture, needs the high-tech capabilities of the Mac; unfortunately, I've had trouble locating any livestock-management packages. Could you furnish a list of suppliers?

James A. McAllen
Linn, Texas

The Macintosh Buyer's Guide lists two suppliers of agriculture-management packages: Hutchinson Computer Industries in Minnesota (612/587-2940) and Dapple-Tech Computers in Maryland (301/490-1200). Data Sources *lists AG Plus Software in Iowa (712/364-2885) and Digipac in Saskatchewan, Canada (306/765-1707). Heizer Software in California (415/943-7667) sells an* Excel *template for swine management.–Ed.*



Corrections
MacLink Plus *suffered a case of mistaken identity in* Commentary *and in "Business Buyer's Guide" in the November 1987 issue. The file-conversion program is published by DataViz of Norwalk, Connecticut, 203/866-4944. MacViz is a real-time video digitizer made by Pixelogic (formerly Microvision) of Stoneham, Massachusetts, 617/438-5520. Our apologies for the confusion.*

Our August 1987 Updates *contains a listing for* Trapeze *1.1, which was never actually released. The current version, 2.0, has been released and is described in this month's* Updates.

*The address for Diehl GraphSoft (*Updates, *August 1987), maker of* MiniCad, *is 8370 Court Ave. #202, Ellicott City, MD 21043. The price for registered users is $19; $495 suggested retail price.*

Rare First Edition
As someone with seven years of experience in the printing and graphics business, I think "First Edition" (August 1987) is the best single article I have ever read for preparing people to deal with printers. Pointing our customers to the article as a primer saves us hours of explanation.

Richard R. Hausfeld
Madison, Wisconsin

The Printer Sees Red
"First Edition" contains enough inaccuracies to cause consternation in the printing community. Some examples: "The camera reads red as black." Many electrostatic camera-platemakers are more sensitive to blue. "Presses do not print to the edge of the sheet." Maybe not a sheet of maximum size, but they *can* bleed three sides of a smaller sheet. "Paper costs can constitute as much as 50 percent of your final printing bill." A good grade of offset paper should account for only 8 to 18 percent.

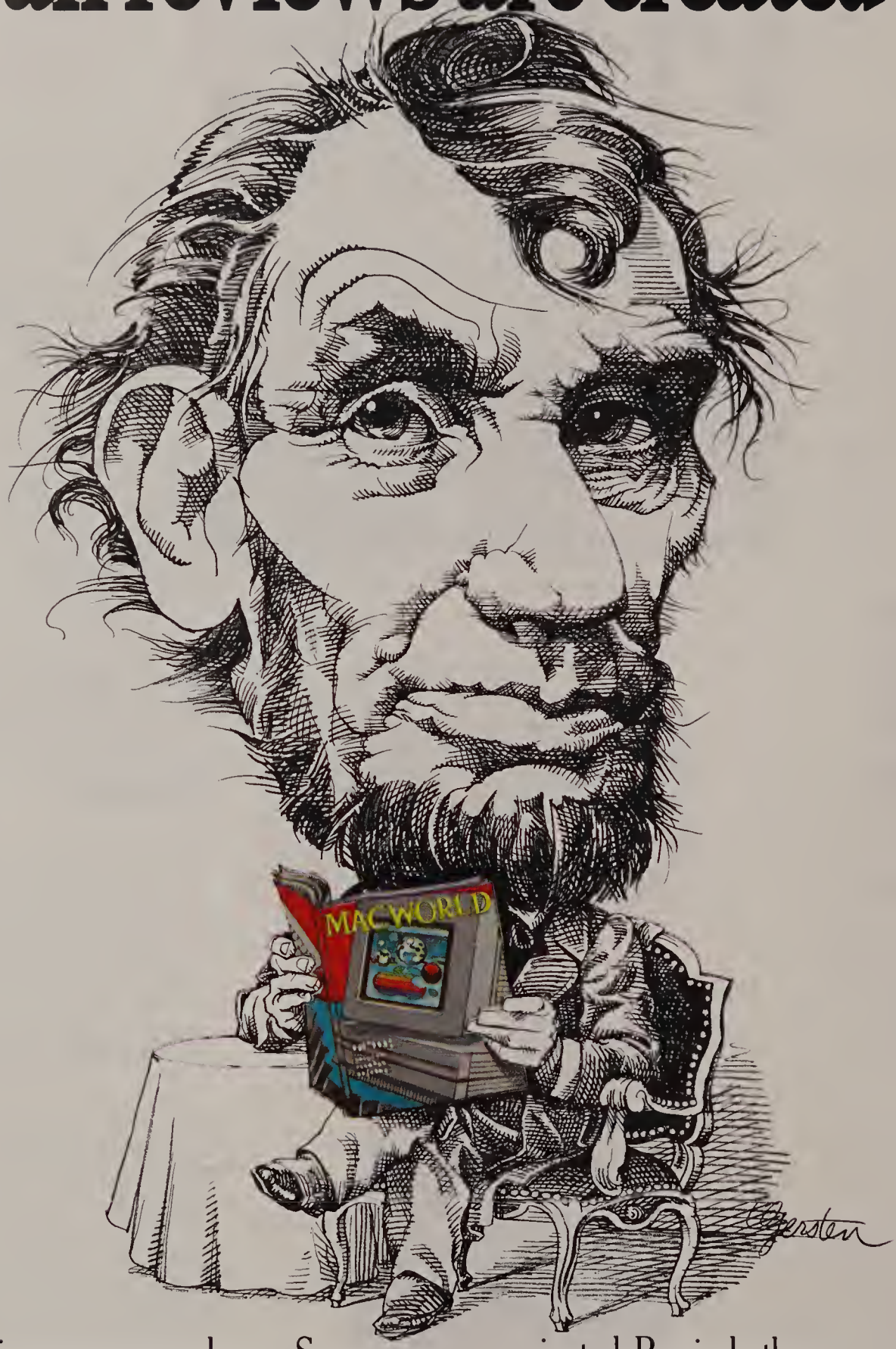
And don't worry about getting burned by a hand waxer–mine heats wax to about the temperature of warm tea, and I have resisted the impulse to wax my hands for nearly 14 years.

H. B. Smith
Pronto Print, Inc.
Bristol, Rhode Island

Suzanne Stefanac responds: "Several printers and seasoned publishers I've interviewed said they've seen paper costs go over half the budget. As for bleeds, I merely cautioned new publishers to consult with printers before doing one, particularly when it falls on the top of a page, since that's usually where the press grips the page."–Ed.

(continues)

Not all reviews are created equal.



Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. MACWORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want.

Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices. MACWORLD, The Macintosh™ Magazine.

MACWORLD GIVES YOU MORE.

MACWORLD

SUBSCRIBE NOW!
SAVE $23.40 OFF THE ANNUAL COVER PRICE

Limited-time offer! Take advantage of Special Savings
Call TOLL FREE 800/524-3200
Visa and MasterCard Accepted

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE. ☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only.

MACWORLD

4BQA2

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE. ☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only.

MACWORLD

4BQA2

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

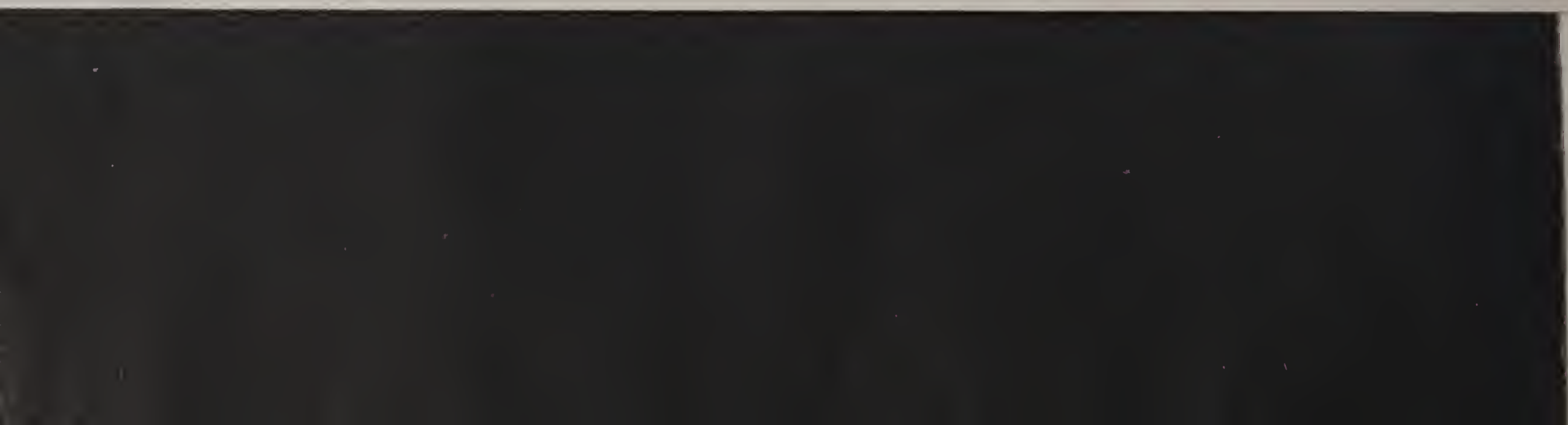
NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666





The hottest sport on a court – the hottest game a Macintosh™ can handle.

Even if you've never been on a racquetball court, you'll spark to the excitement of this challenging simulation.

MacRacquetball turns your Macintosh screen into a full perspective 3-D display of court, players and ball. With the mouse, you have complete control of player position, ball placement, ball speed and shots. Two people can play the same game over AppleTalk® or modem.

Superb graphics give MacRacquetball completely convincing realism. There are more than 1000 frames of ultra high speed digitized animation. It's one racquetball court that's always open when you're ready to play.



Enthusiastic players everywhere have made MacGolf the best selling Macintosh game ever.

MacGolf puts you in the picture, a full perspective 3-D simulation of realistic golf action. You match your skills against fairways, roughs, bunkers, water hazards, sand traps and trees.

MacGolf gives you a player's eye view of the course, in any direction, and an aerial overview of each hole. You have complete control of your position, ball placement, ball speed and direction, and selection of all 14 clubs. Digitized graphics and sounds add to the excitement.

MacGolf is so close to the real thing it will improve your golf game. And by the time you've reached the eighteenth hole you'll know you've been in a real contest.



When you have the best selling Macintosh game in the world, what do you do for an encore?

Here's new turf for adventurous MacGolfers. These are courses to conquer for mouse wielding pros who have taken the measure of the original MacGolf courses.

If you liked MacGolf, you'll love what MacCourses brings to the screen. Four new 18 hole, par 72 courses: Cedar Creek, Golden Sands, Thunder Ridge and PCAI International. The fairways, traps, hazards, and putting greens of MacCourses are in a whole new league.

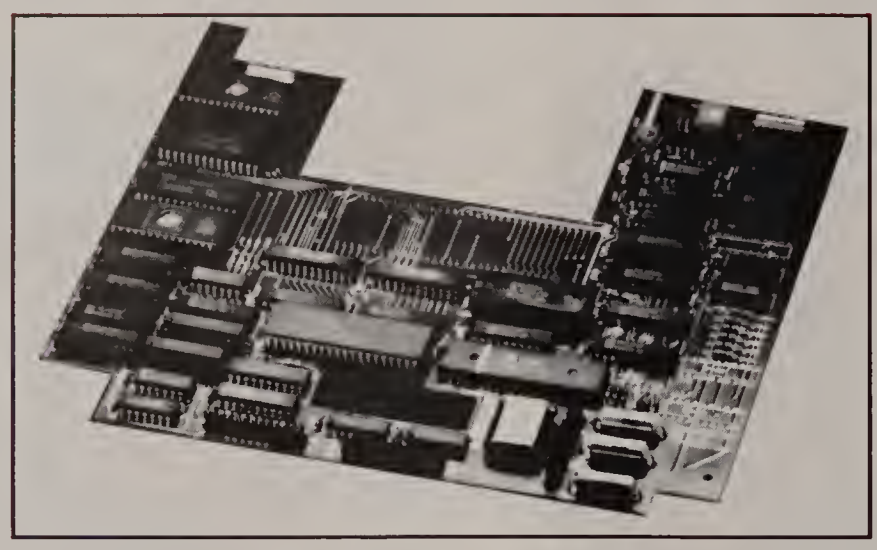
If you thought MacGolf was good training for the outdoor game, MacCourses should turn you into a pro. Get MacCourses now, use it when you're ready – you never know when you'll need the challenge.

PCAI™

©1987, PCAI/Practical Computer Applications, Incorporated 612/427-4789
Macintosh and AppleTalk are trademarks of Apple Computer, Inc.

Circle 211 on reader service card

MS DOS™ BOARD
FOR YOUR MACINTOSH™ PLUS



The Mac+PC™ Co-processor Card from . . . PerfecTEK

Adds the following capabilities to your Macintosh

- Configure up to full 640K memory for DOS applications
- Download or run with third party 5.25″ SCSI diskette drives
- Use Mac 3½″ disk drives for DOS programs and data
- Dedicate or share Macintosh hard disk for DOS application
- Work in the multiprocessing environments of either "Switcher" or Multifinder™
- Use Apple Imagewriter/laser printers or IBM® compatible letter quality printers (option)
- Communicate with MS DOS compatibles using 2 Com.ports
- Emulate IBM CGA/MDA equivalent graphics in DOS window using Mac graphics
- Use our utilities to transfer files between Macintosh and MS DOS
- All of the above without affecting the beauty of your Macintosh and under $1,000.00



For further information, contact:

Marketing Department
PerfecTEK Corporation
726 South Hillview Drive
Milpitas, CA 95035
(408) 263-7757 Telex No. 984281

Please see us at San Francisco
MACWORLD EXPO: BOOTH 240
JAN 14 - 17, 1988

Mac + PC™ is a trademark of PerfecTEK Corporation. MS DOS is a trademark of Microsoft Corporation. Macintosh Plus™ and Multifinder™ are trademarks of Apple Computer, Inc. IBM® is a registered trademark of International Business Machines.

Circle 413 on reader service card

Letters

Restricted Access

In the September 1987 issue of *Macworld,* David Bunnell revealed that the FCC is eyeing an "access charge" that would directly affect individual users, who can least afford it. I oppose this punitive surcharge and concur with Bunnell's suggestion that the FCC start a bulletin board so that it can run a more "open shop." Rather than free up the marketplace, enacting this proposed fee would represent a move in exactly the opposite direction.

Collis Davis
Brooklyn, New York

Data Exchange

Many mainframe databases can read and write ASCII files. Why don't Mac databases provide this feature to aid import and export of data to and from other programs?

Duane D. Kiser
Aiken, South Carolina

Our database expert Jim Heid answers that virtually all Mac database managers–from simple filers like Record Holder Plus *to relational development systems like* dBase Mac *and* 4th Dimension*–can exchange data with other programs via ASCII (text-only) files.* FileMaker Plus *can read and write tab- or comma-delimited text files, while* dBase Mac *reads and writes text files with fixed or variable-length records and supports six different field-delimiting characters. As a mainframe user, you might want to examine Odesta's* Helix VMX, *a VAX-based version of* Double Helix *that provides access to databases for networked Macs.–Ed.*

Sales Pitch

The letter in your August issue from Ted R. Swanek asking about software to record sales leads prompted us to respond. We designed *C.A.T.* with this very idea in mind, to track business contacts. I hope it will benefit other frustrated salespersons who want to use the Mac more effectively.

Debbie A. Bartunek
Chang Laboratories, Inc.
San Jose, California

Compiling Headaches

In using Borland's *Turbo Pascal* 1.00A, I've discovered what I believe is a fatal error in the compiler. Under certain (as yet undetermined) conditions, Boolean expressions involving relational comparisons yield inconsistent results. Borland's technical staff

(continues)

POWERFUL TIME BILLING & MAIL LIST FOR YOUR MAC!

LEGAL BILLING

Legal Billing is a time billing package designed specifically for attorneys and accountants. **Legal Billing** is a full featured system, and yet it is incredibly easy to use. Most firms are up and running in 30 minutes or less!

Here's what **Legal Billing** can do for your office:

- Allows simple and fast entry of information, automatically sorted by date, client, employee and activity
- Customized productivity reports
- Automatic interest added to past due balances
- Client statements formatted in most any way
- Multiple billing rates for each employee
- Aging Report can be customized
- True Work-In-Progress feature holds activity details from month to month

$595.

LEGAL BILLING II

Legal Billing II is an easy-to-use, advanced system designed for small to medium size firms. Includes all features of the basic system plus much more!

- Full trust account reporting
- Archiving of billed services and costs
- Additional billing options
- Handles more employee and activity codes
- Multi-user option available

ABA APPROVED

$895. **$1295.** Legal Billing II + – Multi-user version

NEW from Satori Software

PROJECT BILLING

Project Billing is a time billing package designed for ad agencies, graphic designers, architects and engineers. This package will track all aspects of your project billing including budgets for time and expense, actual costs and billed out amounts for both employee and expenses, and project profitability.

It will also automatically mark-up expenses, and provide productivity reports by employee or project, plus print your client bills in a variety of formats.

This is how **Project Billing** can help you office:

- Tracks employee productivity by cost and billable rates
- Automatically marks up expenses
- Provides profitability analysis by project
- Tracks budgeting of time and expense
- Prints bills and adds interest
- Work-In-Progress holds detail from month-to-month
- Enables progress (partial) billing, while holding all detail
- Multi-user option available

$695. **$1095.** Project Billing + – Multi-user version

BULK MAILER

NEW VERSION! **Bulk Mailer** is a powerful program specially designed for managing lists. **Bulk Mailer** does everything you want in a mail list program, including duplication elimination, zip and alpha sorts, 1 to 4 up labels printed, easy-entry defaults, multiple label format, plus, much, much more.

This is the only program to offer all these features.

- Duplication elimination
- Zip or alpha sort
- Car-rt sort or zip + 4
- 1 to 4 up labels or roster format
- Powerful coding capabilities
- Sophisticated global editing and deleting
- Mail merge with Microsoft Word
- Easy-to-use entry defaults
- Coding and date expiration fields
- Large record capacity (up to 90,000 names)
- Hard disk compatible

Now shipping version 3.0

$149. Bulk Mailer – up to 8,600 names

$350. Bulk Mailer + – up to 90,000 names



"The Eagle Design postage meter indicia without printed information is a registered service mark of Pitney Bowes Inc.

Call or write for more information or the name of your local authorized dealer.

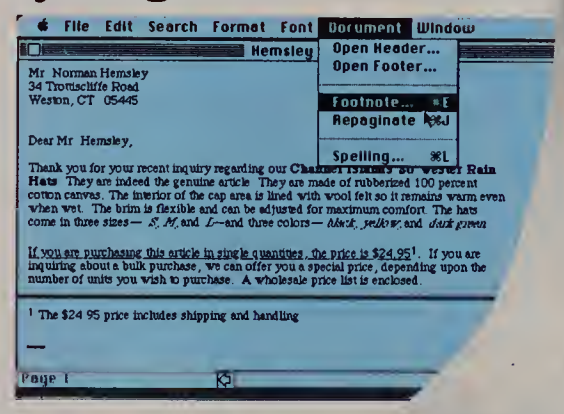
SATORI SOFTWARE

Satori Software
2815 Second Avenue, Suite 590
Seattle, WA 98121 206/443-0765

Write from

When it's time to start putting words on paper, Microsoft® Write is the right place to start. Because no comparably-priced word processor gives you as many features. Or an easier way to get at them.

If you already own a Macintosh,™ you already know how to use Microsoft Write. Because it shares all those great Macintosh qualities. Like comprehensive, pull-down menus. And familiar point-and-click operation.



Teamwork at work. You supply the words, Microsoft Write supplies the footnote number and location.

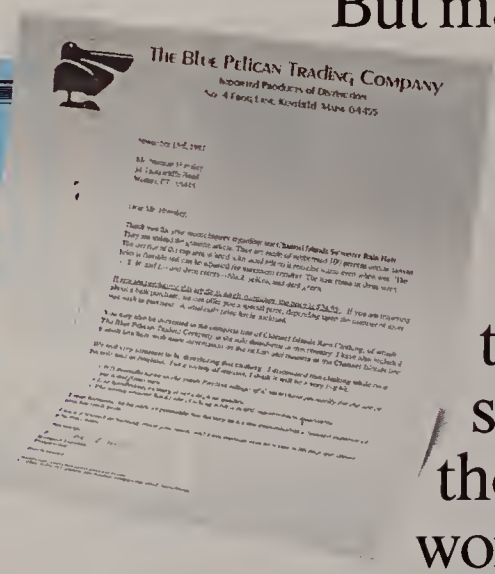
But don't worry if you've never made friends with a mouse before. Microsoft's exclusive on-line context-sensitive Help puts the answers to most of your questions a mere button push away.



Microsoft Write's 80,000-word, customizable dictionary helps our built-in spelling corrector make all your words letter-perfect.

Plus you get all the documentation and telephone support that's helped make Microsoft's family of products the most popular of all Macintosh applications.

But making it easy to get your words on paper is just the beginning.



For example, thanks to a built-in spelling corrector, those well-chosen words of yours will all be impeccably spelled. And, thanks to another innovative feature, properly placed as well.

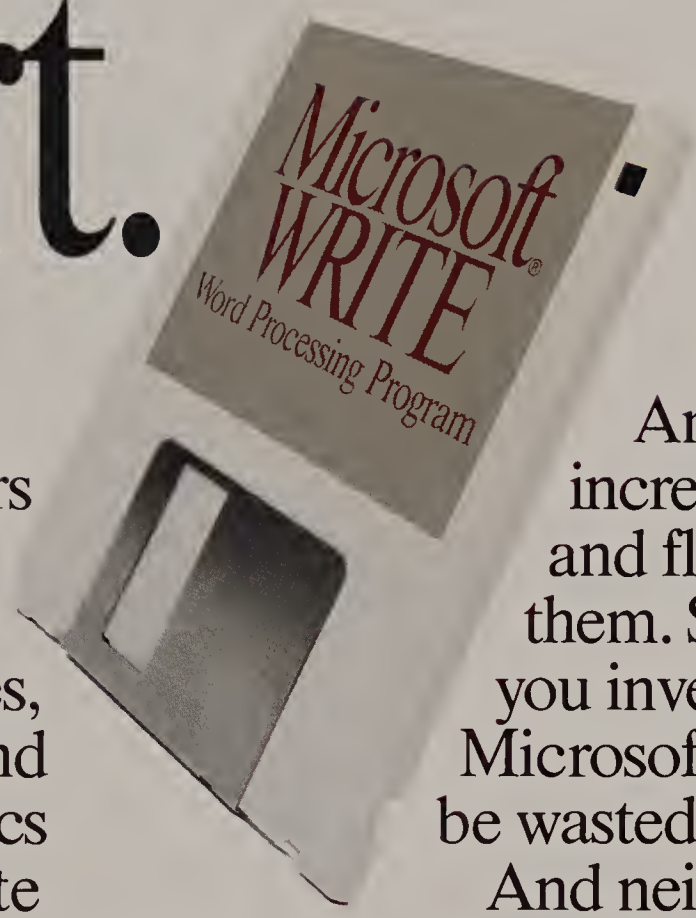
Because the page preview command offers you the unique opportunity to examine your work a miniature page at a time. So you can review, and revise, all those little factors that make the difference between a good looking document and a great one.

AAAA

Team Microsoft Write with a LaserWriter™ printer and your words

Microsoft is a registered trademark of Microsoft Corporation.

the start.



Like where pages break and margins fall. And how the headers and footers lay out.

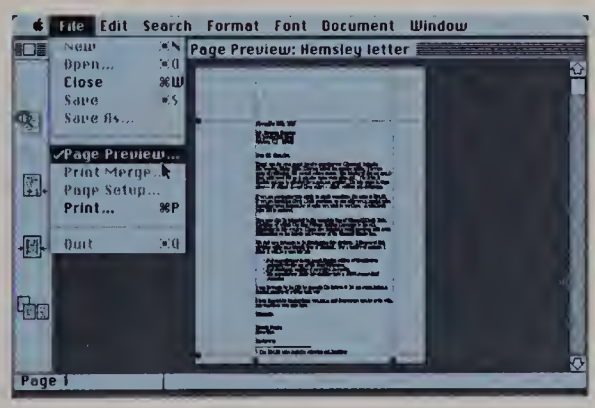
What's more, with advanced features like automatic footnotes, newsletter-column formatting, and the ability to mix text and graphics on the same line, Microsoft Write adds authority, and clarity, to all types of writing. With about as much effort as it takes to dot an i.

But Microsoft Write doesn't stop there.

As your word processing needs grow, you can always take advantage of the powerful, professional features of the Macintosh's leading word processor, Microsoft Word, Version 3.

Without going back to page one.

In addition to using your existing files, Word uses the same commands as Microsoft Write.



With Microsoft Write's page preview command, what you see on the screen is what you'll see on your paper. Line after line after line.

AAAAAAAA

can stand as tall, or as small, as you'd like.

And then adds incredible features and flexibility to them. So the time you invest with Microsoft Write won't be wasted.

And neither will your money. All registered Microsoft Write owners can upgrade to Word at a special, reduced price.

Before it's time to face up to the infamous blank page, call (800) 541-1261, Dept. C73, for the name of a Microsoft Write dealer near you.

Trust him to give you everything you need to get your writing started.

Except, perhaps, an opening line.



Got a question? Microsoft Write's on-line, context-sensitive Help gives you the answer. Right on the spot.

Microsoft® Write

Macintosh and LaserWriter are trademarks of Apple Computer, Inc.

acknowledged the problem but could supply neither a fix nor a workaround. Please alert your readers so that they can save themselves some headaches trying to debug correct code that's executing in an incorrect compiler.

Keith R. Barker
Mountain View, California

Borland says it has since fixed the problem in an upgrade and has been sending out free replacement disks to users who've reported the bug.–Ed.

The Great SE Debate

As an Apple dealer, I must refute Steven Levy's claim ("Macintosh SE: The Great Compromise," *Macworld* September 1987) that the SE's slot is not needed because dealers can connect circuitry to the Plus. While it may take ten minutes to install a board in the SE, in the Plus it can take hours. Levy laments the high cost of an upgrade if and when the SE begins to use the 68020, then says Apple should have boosted the price by including it in the first place.

Further, the SCSI port speed and the 15 to 20 percent increase in operating speed are more than just "a little faster." Levy is finding fault where there is no fault to be found.

Robert L. Hyde
Coon Rapids, Minnesota

Tarnished Magic

To update your review of our MagicDrive hard disks (*Reviews,* September 1987): the drive's new software does include a head-parking utility, and some time ago we extended our six-month warranty to one year. In addition, we object to the MagicDrive's comparison to the SE's internal hard disk, since our drive was tested using a Mac Plus, which is slower than an SE.

John Kinnaird
MacProducts USA
Austin, Texas

All comparisons–except the one with the SE–were against other drives tested on a Plus. Incidentally, the time-to-duplicate test using the Jasmine 80 drive showed a minimal 8 percent speed difference between the Plus and the SE. –Ed.

North of the Border

Are there any Mac user groups in Canada that distribute public domain software?

Mario Bellabarba
Sherbrooke, Quebec

The only group we found was Apple Canada in Markham, Ontario (416/477-5800). Perhaps that group can put you in touch with others we don't know about yet.–Ed.

Rough Draft

SuperSpool 4.0 has some nice features, but it doesn't do draft mode. Is there a conservation-of-bugs law? It seems that Microsoft has fixed its draft-mode bug at about the same time SuperMac has found a new one.

Jerry DaBell
via AppleLink

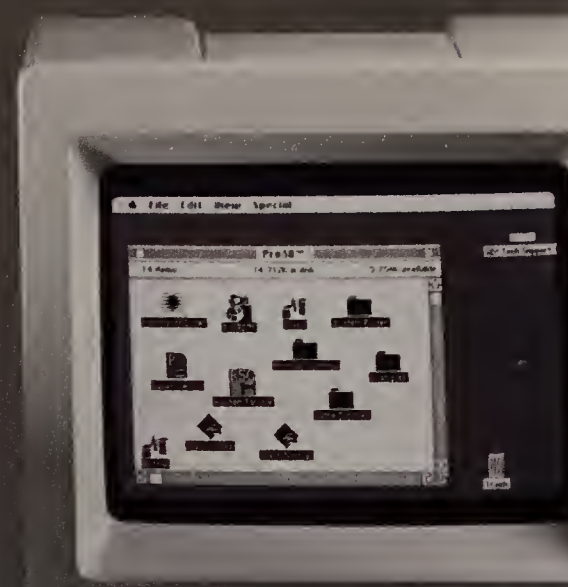
Letters should be mailed to Letters, Macworld, *501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to* Macworld*). Include a return address. We reserve the right to edit all letters. All published letters become the property of* Macworld. □



Circle 597 on reader service card

WE HAVE THE BEST VIEW OF THE MACINTOSH WORLD: 1664 x 1200





S I G M A D E S I G N S

NOW AVAILABLE AT ALL BUSINESSLAND CENTERS

When they say a picture is worth a thousand words, they're describing LaserView,™ ultrahigh-resolution large-screen monitors from Sigma Designs.

Available for the Macintosh™ SE and Macintosh II in 15-inch and 19-inch sizes, LaserView provides a 1664 x 1200 on-screen pixel display (equal to 11 Macintosh SE screens). And because LaserView is a noninterlaced monitor, text and graphics are displayed virtually flicker-free. Even facing pages.

You can select the default display mode of 1664 x 1200 pixels (2,000,000 pixels). Or choose the standard Macintosh resolution of 72 dots per-inch which yields an on-screen pixel resolution of 832 x 600 (500,000 pixels). You can choose from three cursor sizes and two system font sizes for legibility.

For more information on LaserView, call Sigma Designs today at (415) 770-0100. Or visit an authorized Sigma Designs dealer.

Because for computer-aided engineering, advanced desktop publishing and anything in between, LaserView offers you a totally new point of view.

Sigma Designs, Inc.
46501 Landing Parkway
Fremont, CA 94538

LaserView is a trademark of Sigma Designs, Inc.
Macintosh is a trademark of Apple Computer, Inc.
For commercial use only.

Circle 743 on reader service card

"SIMPLY PUT, CIRRUS DRIVES ARE A JOY TO WORK WITH."

"These are powerful drives with powerful software."

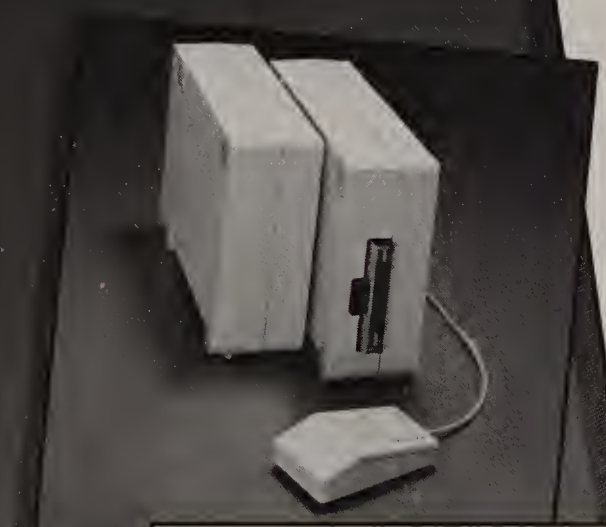
"Using Cirrus drives gave us an appreciation of the importance of ergonomic design to performance."

"Cirrus drives are quiet and easy to work with...a plus to their performance rating."

"Very small and lightweight, (Cirrus drives) are constructed of quality materials designed to last."

"The Cirrus drives have the most exciting, simple and elegant design we have seen in a hard drive for the Macintosh."

Michael Day
The Macintosh Journal



From
$449.99

SLOT MACHINE 20, 30, 40, 60
20-60 Mbyte internal Mac SE hard disks

CIRRUS 20, 30, 40, 60
20-60 Mbyte Mac external hard disks

CIRRUS 40T
40 Mbyte tape backup

Systems include drive, cable, software and manual.

The Macintosh Journal

Cirrus Drives

The Cirrus drives are exciting and excellent performers. They offer impressive speed, flexible software, attractive design and quiet operation.

Ease of Use

Running a Cirrus drive is very simple. It is just a matter of plugging the drive in and turning it on. The drives come pre-formatted and ready to go. The Cirrus has two DB 25 connecters on its case, so its cables are easier to work with than the "standard" SCSI cables that come with some drives. The design of the Cirrus drives contributes greatly to their ease of use.

The software that comes with the Cirrus drives is very flexible. It follows the Macintosh interface closely, and is well done. With the software, users can partition the drives into several volumes, or combine several drives into one single volume. Volume sizes can be changed or new ones added at any time without losing data. Password protection, manual or automatic mounting, automatic head parking, backup utilities, and disk repair utilities are all standard. In addition, the software performs several diagnostic tests including the ability to map out bad sectors and program the drive's interleave. In short, this is some of the most extensive and best written software available for Mac hard drives.

Most of the Cirrus' flexibility comes from their excellent software. However, the physical construction of the drives also contribute to their superior flexibility. Unlike other drives for the Mac, Cirrus drives can be placed vertically or stacked horizontally depending on your desktop requirements.

Performance

Cirrus drives were engineered to perform well in everyday situations. These drives are very fast when performing common operations such as going to the chooser or building the desktop. Reading and writing to and from files is also very fast. Using the Cirrus drives gave us an appreciation of the importance of ergonomic design to performance. For instance, fan noise can increase fatigue in office workers. A drive that is built to be quiet and easy to work with may not increase the data transfer rate, but it will help to get more productivity out of the user. Cirrus drives are quiet and easy to work with which we consider to be a plus in their performance rating.

Because the Cirrus software is so good, users may want to use it to initialize drives from different manufacturers. In our tests, this worked well, and allowed drives of differing origin to be linked together as one volume. Since many of the older SCSI drives came with poor software, this is a good argument for buying a Cirrus drive and chaining it with other drives after they have been initialized with the Cirrus software.

Design and Construction

The Cirrus drives, though very small and lightweight, (about 4 lbs.), are constructed of quality materials designed to last. Their light weight is due to the small number of components in each drive and to their plastic case. The Cirrus drive is both sturdy and durable; the internal power supply is encased in aluminum, and the drives are shock mounted on rubber bearings.

The Cirrus drives have the most exciting, simple and elegant design we have seen in a hard drive for the Macintosh. The modular construction of the drives means that any repair work will be quick and easy. Simply put, Cirrus drives are a joy to work with.

Recommendations

Cirrus drives were designed for the the professional user. They were not engineered to be low cost products, or to be "just adequate performers;" they are built with premium components. These are powerful drives with powerful software. Cirrus drives are an excellent solution for users who demand a lot. Readers should also note that several new products are in the pipeline and that a 40MB tape backup and 30MB hard drive are currently available. We give the Cirrus 20, 40 and 60 drives an excellent rating (8 on a scale of 10) and recommend that other drive manufacturers follow the Cirrus example, and design drives that are simple, elegant and impressive performers. *-Michael Day*

© B and P Publishing

See us at San Francisco MACWORLD Expo.

Visa and MasterCard accepted.

CALL TO ORDER 1-503-684-0143

*Cirrus is a trademark of Cirrus Development Corporation. Macintosh is a trademark of Apple Computers. Prices and specifications subject to change without notice. Prices quoted are cash prices. Mouse not included. Excerpts reprinted with permission of Mac Journal.

LaCie, Ltd.
16285 S.W. 85th, No. 306
Tigard, Oregon 97223

Circle 119 on reader service card

Commentary/Jerry Borrell



Thanks for the Memory

It's MultiFinder! Do you know where your memory is?

"It quit."

"What quit?"

"Excel."

"Excel?"

This, I thought, does not bode well. A newly upgraded Mac Plus with a large screen, running the latest version of MultiFinder, sits on the desk of Jane Lagas, our Editorial Manager. She uses it for budgeting, planning, author contracts, and more. Thirteen megabytes worth of information. This is a machine that we cannot afford to have acting up.

"Ah. Maybe it's MultiFinder."

I pull down the Special menu, and select Set Startup. So far so good. Select the Finder option in the dialog box. Then restart. No icon in the upper-right corner, so we're in the Finder. And, yes, *Excel* opens up. Talk about a rude awakening. A Mac Plus upgraded to 2MB cannot run MultiFinder and *Excel*.

True, *Excel* is a notorious memory hog. True, Jane does run large spreadsheets on her system, and the display screen needs sufficient RAM to support a full 1024-by-780 screen buffer. But the implications.

I had only just managed to convince my management that we needed to have several of our Mac Pluses and Mac SEs upgraded to 2MB. Eleven upgrades. We managed to buy the memory for about $6000. (We bought the memory from an Apple developer, before Apple had lowered its price for 1MB to about $599.)

Incredible. Two megabytes is not enough. Not that 2MB has any particular connotation, but I had thought we'd be "power users" with that amount.

I already knew that 2MB on the Mac II is insufficient. For our first demonstration of Interleaf's electronic publishing program for the Mac, the company had to bring 4MB of memory to add to our Mac II just to show us the package. I also remember the demonstration of Microtek's new 8-bit scanning software that wouldn't work properly with only 2MB. Then there's my trouble with Bravo's *MacCalc,* the spreadsheet that I use for planning: it quits frequently–"Out of Memory."

Come to think of it, SuperMac's *Pixel Paint* does something similar, but less rudely. When I try to launch the program on my machine, I get a dialog box politely informing me that there is insufficient memory to use the package, but would I like to open it with the memory available? At least I can use the program. On the other hand if I try to open a large picture file, the program opens only the application, not the picture.

Having faced the fact the the Mac II is a 5MB-base machine–that is, it needs that much memory to run many of the new programs I try–I could accept a 2MB minimum for the Plus and the SE. In fact, I noted in this column a month ago that the Plus/SE family was moving to a 2MB base. Finding that even this amount may be insufficient was frightening.

There are several implications, but for the first time as an administrator I was facing a very contentious issue. How can I afford to upgrade the memory of the 20-plus Macintoshes in our department? And if I do, is 2MB enough or do we need more?

Of course, memory sellers should be in heaven.

But wait. Do I recall a demonstration of MultiFinder that showed how to minimize the amount of memory used by applications? I plow into the documentation (blissfully straightforward). It says to open the System Folder and select About Finder. (It never says MultiFinder in the About box, even when you're using MultiFinder.) A little chart pops up that tells me how my system's memory is distributed: 224K to *WriteNow,* 160K for the Finder (I assume this is the combination of the Finder and MultiFinder), and 409K for the System.

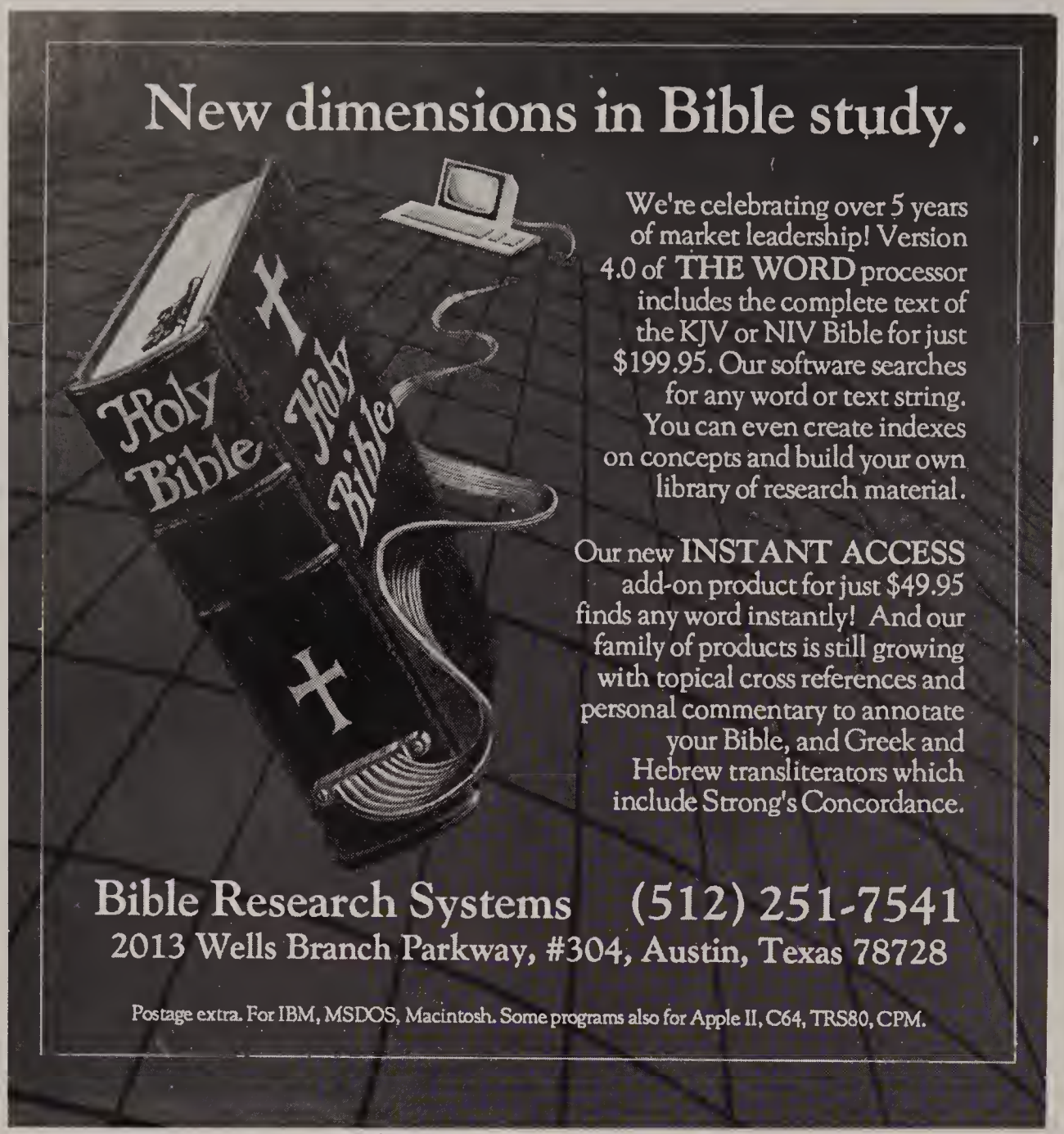
A good start, but is there actually a way to indicate how much memory I must dedicate to each application? Read on. If you select an application while in MultiFinder and then request Get Info from the File menu, an updated dialog box opens up showing two new entries: the amount of memory Apple recommends you allocate for the application and the amount of

(continues)



APPLE COMPUTER, INC.

Apple's Charlie Oppenheimer champions MultiFinder, a first step toward multitasking.



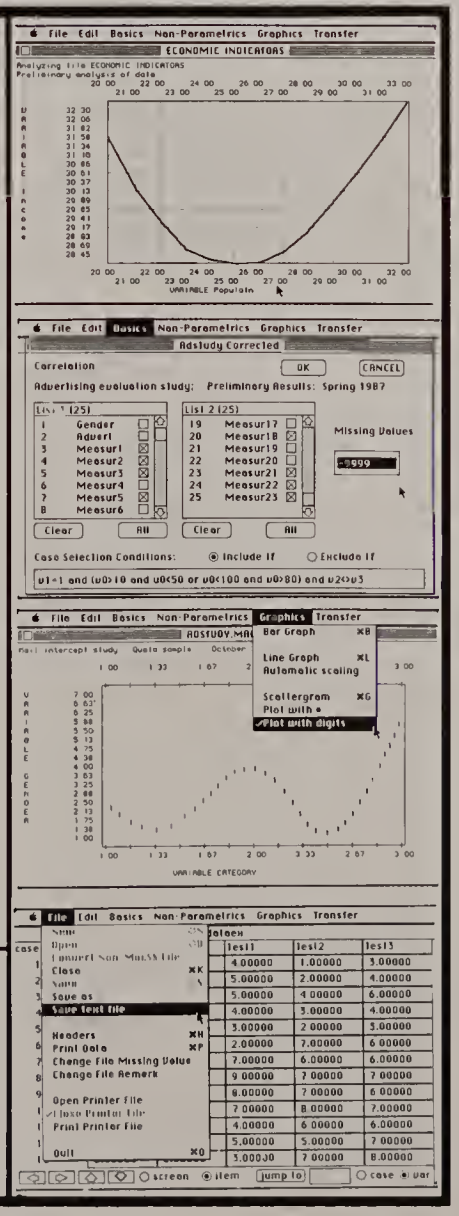
Circle 20 on reader service card

Limited time price $119

MacSS™

Macintosh ***STATISTICAL SYSTEM***

- Unlimited size of data files, double precision calculations, mainframe speed
- Complete statistical data-base management with spreadsheet
- Comprehensive selection of Descriptive, Basic, and Nonparametric statistics
- Crosstabulation and Frequency Tables
- General Multiple Regression with Forecasting (up to 50 predictors)
- General ANOVA/ANCOVA (up to 10 within/between factors)
- General (multifactor) MANOVA (up to 100 dependent variables)
- Discriminant Function Analysis
- Contrast Analysis
- Graphics and Exploratory data analysis
- Flexible selection of subsets of cases for each analysis
- Easy import/export of data and output; can access files created by spreadsheets and data-bases
- True Macintosh user interface (not a mainframe adaptation)



Available from your dealer or from StatSoft ($245 + $5. sh/h)
limited time offer: $119 + $5. sh/h

MasterCard VISA

StatSoft™

2325 East 13th Street, Tulsa, OK 74104 (918) 583-4149

Circle 225 on reader service card

Commentary/Jerry Borrell

memory you choose to devote to the application.

Let's say for example that I want to run *WriteNow* and *Pixel Paint*. I'll just keep on writing this column (saving first) and try the aforementioned procedure. Well, *Pixel Paint* needs an additional 1677 bytes; it won't open. So I'll adjust the memory used by *WriteNow*. That's odd, the suggested memory size doesn't appear in the Get Info box for *WriteNow*. I expect we'll see a lot of those discrepancies until developers catch up with the new System and Finder.

Maybe another application; how about *Excel?* I'll try a big file, say a 286K list. No luck; won't open. A blank *Excel* file does open. But I can't get at that list. Hmmm. I'll consult the Finder memory distribution box once again. Let's see: *Excel* 272K, *WriteNow* 224K, Finder 160K, System 430K.

As I sit pondering this, I have creeping memories of past experiences. Like the time I installed my first hard disk on an IBM PC. But this is the Macintosh. I didn't fall in love with this computer to have to partition my memory each time I open up a desktop full of applications. I don't want to understand fragmentation of memory that may prevent me from opening this or that application. The Mac should take care of this. I don't have time to play hacker/enthusiast with my Mac these days—I do too much work with it.

So the simple solution is to buy enough memory to avoid the issue. At least that appeared to be the answer until I discovered that even 2MB doesn't do it. And if I resolve this dilemma, I still have to worry about the potential for overheating the system board with all of that memory.

The Mac II is another story. The shortage of 1-megabit memory chips has postponed upgrades for the Mac II until recently. True, the cheaper 256K RAM chips are available, but they have a problem. It takes four times the chips to add an equivalent amount of memory, making it impossible to put the maximum 8MB on the Mac II system board. Also, until recently the Mac II had a 1MB limit per slot. The latter problem has been solved with a change in the Mac II's ROM, allowing developers to build cheaper memory cards for Mac II slots. It hardly seems a coincidence that Apple should lower its memory prices as this becomes possible. Whatever the marketing implications, at last we have memory coming for the Mac II.

(continues)

DirectDrive Series

Affordable, reliable performance for *all* of us.

20 to 160 megabytes: a full spectrum of drives to meet every user's needs. The Direct Drive Series put all of us in business. Their excellent construction, high reliability and no cost "extras" have won them a wide following. Just look at what you get:

- Pre-formatted, they work right out of the box.
- Three way surge protection.
- The original external SCSI select switch plus a terminator access panel.
- 10″x10″x approximately 2″ high, they fit neatly beneath the Macintosh.
- Free 2′ SCSI cable. 6′ cable available for small additional cost.
- Back-up software plus 9 MB of shareware and PD software.
- Full 1 year limited warranty.

We also include the quality support and service you expect from Jasmine.

JasPort: SCSI Power for the Macintosh 512

JasPort – our Macintosh Plus compatible SCSI port for the Macintosh 512 Enhanced or 512K with ROM upgrade – permits Macintosh users to take advantage of Jasmine's DirectDrives, MegaDrive, and other SCSI devices. User installable. ***$129*** *(Cash/Visa/MasterCard)*

Technical Specs: Direct Drive 20, 40, 50, 80 and 160

Drive:	20	40	50/80	160
Capacity, after formatting:	21Mb	40Mb	51Mb/77Mb	150.1Mb
Access Time:				
Track to Track	20 msec.	8 msec.	5 msec.	4 msec.
Average	65 msec.	40 msec.	26 msec.	16.5 msec.
Maximum Seek	150 msec.	95 msec.	38 msec.	43 msec.
Average Latency	8.33 msec.	8.33 msec.	8.2 msec.	8.33 msec.
Mean Time Between Failure:	20,000 POH	20,000 POH	25,000 POH	30,000 POH

AC Outlets:

3-way with ground Fully fused	
Rated Capacity:	7 Amps
Switched:	At power on
Surge Protection:	Protects drive and outlets

SCSI controller:

Transfer rate (per second) maximum: 1.25 Mbytes, supports 1:1 interleave.



To Order Call (415) 621-4339 VISA MasterCard

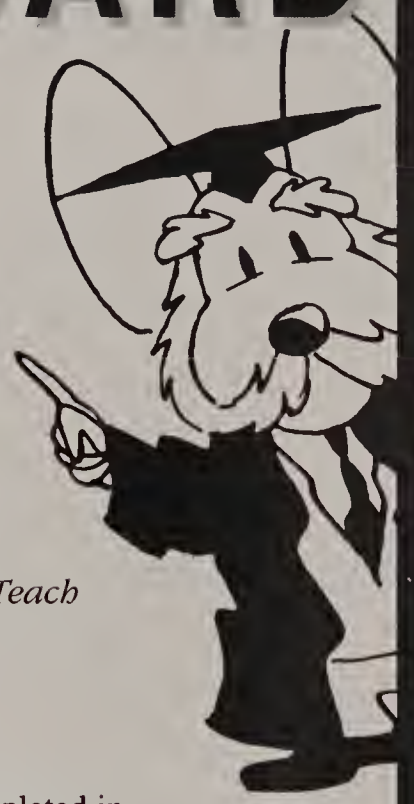
Remember that Jasmine saves you 40% or more.

Every drive is shipped with a technical hotline number to answer any questions. Drive Drive 20, 40, 50, 80, and 160, Jasmine, are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2′ cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Macintosh is a trademark licensed to Apple Computer, Inc.

Jasmine Technologies, Inc.
555 DeHaro Street, San Francisco, CA 94107

Circle 641 on reader service card

HYPERCARD made HyperEASY



"Learn HyperCard fast -- without reading anything!"
Professor MacTeach

Quick and Easy

Each tutorial can be completed in about an hour. You learn by hearing and doing. Friendly instructors on an audio tape talk you through the HyperCard program.

Four Tutorials Available

Using HyperCard
Creating Cards & Stacks
Basic Scripting
Advanced Scripting

SHIPPING NOW!

Order today by calling or mailing the coupon.

(408) 559-8635

You are welcome to call collect.

HyperEasy Training

Using HyperCard	$39.95
Creating Cards & Stacks	49.95
Basic Scripting	49.95
Advanced Scripting	49.95
Subtotal	____
Shipping & Handling	$5.95
CA — Add Sales Tax	____
Order Total	____

Name _____
Company _____
Address _____
_____
Daytime Phone (____) _____
☐ Check enclosed ☐ P.O. enclosed ☐ VISA/MC ☐ AmExp
Credit Card Number _____
Expiration Date _____

. . . Personal Training Systems . . .
P.O. Box 54240, San Jose, CA 95154, (408) 559-8635

☐ Send me information on your other tutorials — for Microsoft Word, Excel, Works, Aldus' PageMaker, and MORE from Living Videotext.

Circle 560 on reader service card

Commentary/Jerry Borrell

Nor are these the only difficult situations facing administrators using Macs today. Take networks for example. Already we at *Macworld* are faced with the need to add a staff position to administer our network. At present Eileen Drapiza, our New Products Editor, takes care of this, but she's growing ever so tired of having to drop her work when the hue and cry goes up that "the network went down" or "the printer won't." Witness a recent five-day episode during which the LaserWriter appeared like a will-o'-the-wisp in our machines' Chooser boxes. The culprit was, of course, a nonterminated AppleTalk cable that runs to our art department. That discovery was of little solace to Eileen or to Senior Associate Editor David Ushijima, who lost valuable time playing network sleuths.

The solution is to add an individual to staff whose task it is to help upgrade System software and the latest drivers and keep the network working. But that's an expensive solution.

There is good news from the front. With Apple's release of MultiFinder, which will be sold at dealers for about $50, we no longer have to worry about updating specific files in the System Folder. Now you insert the floppy disk, select Install, select the CPU that you intend to install the new software on, and select Install again. The installer replaces what it needs to. That's right—no more System-version hieroglyphics other than the single version number. You do have to boot the Mac from the new software disks, install, and then restart, but that seems a trivial inconvenience by comparison.

One light comment on the state of Mac affairs. You should write to Educomp (listed in the introduction to *Where to Buy*) for its library of start-up sounds for the Plus and SE—every cult classic imaginable. They automatically sound off whenever you start up the Mac.

Someone should build a library of dialog-box sounds. The next time I get one of those "Out of Memory" dialog boxes, I'd like to have something like the Klaxon from Epyx's *Sub Battle Simulator:* "Prepare to dive!" □

Visit us at MAC EXPO San Francisco

InnerDrive Series





NEW

InnerDrive 40/SE

Expand your Macintosh SE *without removing one of your drives.* 40 Megabytes, 29 msec access time. **$999**

Now that your Mac's open for business, let Jasmine provide the inventory.

Jasmine's InnerDrive Series brings you high speed, yet economically priced, internal hard disk drives for the Macintosh.™ Pre-formatted, they work right out of the box and are very easy to install requiring no special tools or expertise. These self-parking drives include mounting bracket, cables and other hardware plus nine megabytes of public domain software, shareware and back-up software. Plus a full 1 year limited warranty. We also include the quality support and service you expect from Jasmine.

Technical Specs: InnerDrive 50, 90

Drive:	50/II	90/II
Capacity, after formatting:	51 Mb	88.0 Mb
Access Time		
Track to Track	5 msec.	4 msec.
Average	26 msec.	16.5 msec.
Max. Seek - Full Stroke	38 msec.	43 msec.
Average Latency	8.2 msec.	8.33 msec.
Mean Time Between Failure:	25,000 POH	30,000 POH

SCSI controller:
Transfer rate maximum: 1.25 Mbytes/sec., Supports 1:1 interleave.

Every drive is shipped with a technical hotline number to answer any questions. Jasmine and InnerDrive are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Macintosh is a trademark licensed to Apple Computer, Inc.

InnerDrive 90/II: ***$1499*** *(Cash/Visa/MasterCard)*

InnerDrive 50/II: ***$999*** *(Cash/Visa/MasterCard)*

To Order Call (415) 621-4339

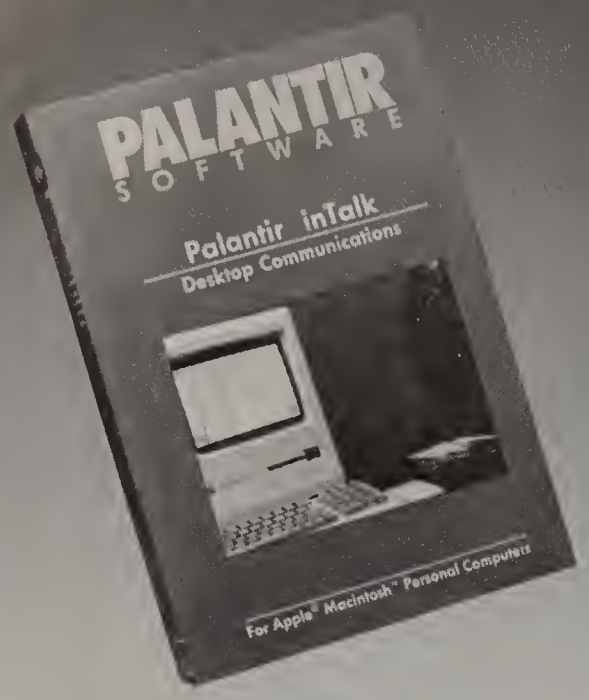
Remember that Jasmine saves you 40% or more. Our prices include a Full One Year Warranty.

Jasmine Technologies, Inc.

555 De Haro Street, San Francisco, CA 94107

Circle 457 on reader service card

Desktop Communications for Macintosh



Palantir's inTalk® Version 3.0

inTalk continues to set the standard for state-of-the-art communications with micro, mini, and mainframe computers. The newest release of inTalk includes a variety of new, high-powered features for desktop communications:

- Support for Super Fast, Error Correcting Modems
- Complete Support for PBX Data Networks
- Yterm Binary Transfers for IBM Mainframes
- Clipboard Transfers for Remote, Interactive Work
- Support for All Macintosh Keyboards and Character Sets
- New CCL Script Commands for Automated Communication Sessions
- VIDTEX Emulation for CompuServe's Graphics
- Programmable Function Keys That Can Launch a CCL Script

For PC compatibles there's **Windows inTalk** with the same features and ease of operation. Both are perfect for corporate use, because there's no retrainig when office personnel are shifted between computers.

Whether communicating with another Macintosh, a PC, or the corporate mainframe, no one does it better than Palantir!

For More Information Contact Your Dealer

PALANTIR®

12777 JONES ROAD, SUITE 100, HOUSTON, TEXAS 77070 (713) 955-8880

Circle 775 on reader service card

HFS compatible including hard disks!

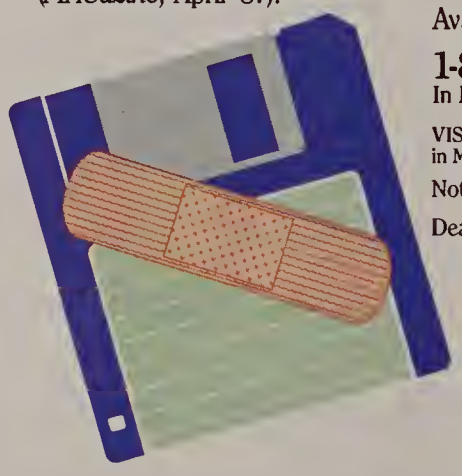
Solve Mac problems like an expert!

"1st Aid Kit™ falls into that special category of 'must-have' products" (*MACazine*, April '87). It lets you handle every Mac problem from difficulties copying files, printing, and using AppleTalk networks, to recovering lost data from deleted or damaged files and unreadable disks.

Acclaimed by novice and expert alike, the 1st Aid Kit is much more than powerful software. At its core is a clearly written reference manual that:

- lists every imaginable error condition
- helps you quickly track down solutions to any problem
- takes you step-by-step through each recovery effort
- shows you how to avoid problems

"The definitive product for troubleshooting on the Macintosh™" (*Macworld*, April '87). It "stand[s] head and shoulders above any other product like it . . . I can't recommend 1st Aid Kit strongly enough" (*MACazine*, April '87).



1st Aid Kit $99.95

HFS Version: MacPlus, Mac SE, Mac II
MFS Version: 128KMac, 512K Mac, MacXL

Available direct order 24 hrs.

1-800-THE-FIXR
In MA 617-847-4190

VISA & MC accepted, $5 s/h UPS ground, in MA add 5% tax

Not copy protected

Dealer inquiries welcome

1st Aid Software, Inc.

42 Radnor Road, Boston, MA 02135

Macintosh is a trademark of Apple Computer, Inc.
1st Aid is a trademark of 1st Aid Software, Inc.

Circle 628 on reader service card

Contributors Notes

Michael Alexander *("HELP!" and "Mac Charting Tools") is an* Excel *spreadsheet jockey who bought a Macintosh soon after covering the machine's debut for* Newsweek. *Ever since, he's helped friends, acquaintances, and even strangers on the street solve their hardware and software problems.*

Danny Goodman *(*Business Clinic*) has been writing about computers since the 1970s and has used the Mac since before its release. A* Macworld *contributing editor, he is the author of* Hands-on Excel *(Scott, Foresman & Co., 1986) and* The Complete HyperCard Handbook *(Bantam Books, 1987).*

Bruce Maurier *("Insights on Adobe Illustrator") is an editor and illustrator with Publishing Power, a Palo Alto, California, desktop publishing firm. Since the day* Illustrator *shipped, he has been using it to produce commercial and technical art.*

Jim Morton *("Shades of Gray") is a San Francisco printer and desktop publisher who produces* Pop Void, *a periodical about modern culture, using* PageMaker.

Erfert Nielson *("The PostScript Difference") was a founding member of the* Macworld *staff. She put her art-school training to work and quickly became a Mac graphics specialist. Currently doing free-lance writing in Hollywood, she is probably the only writer in town not working on a screenplay.*

Lon Poole *(*Quick Tips*) has been educating Macintosh users since the machine was introduced. In his monthly column he answers questions and offers advice. A collection of these tips can be found in his book,* Mac Insights *(Microsoft Press, 1987).*

Kevin Rardin *("Insights on Adobe Illustrator") is a desktop publishing and technical communications consultant. He's also the author of* Desktop Publishing on the Mac *(Plume/Waite, 1986), which won the 1986 Computer Press Award for the Best How-to Book.* □



The Monitor That's Changing The Look Of Desktop Publishing.

Introducing the 19-inch Viking 1 for the Macintosh™ SE.

The critics have praised the Viking 1 as **"magic"*** *and* **"the clear winner"**** *for desktop publishing on the PC. Now this exciting new monitor is about to change the look of desktop publishing on the Macintosh.*

Here's why:

Introducing "Publishing Resolution.™"
The Viking 1's 19-inch screen allows for a full two-page layout. Its ultra-high 1280 x 960-pixel resolution provides a precise, tack-sharp image–unlike lower-resolution monitors that make it tough to read the fine print. Or higher-resolution monitors that create letters too tiny and fuzzy to read. And the Viking 1's unique square pixels assure that screen and laser-printer characters match perfectly.

Eliminates Flicker.
Some monitors have an annoying flicker that can frazzle your nerves. The Viking 1's exceptional non-interlaced 66 Hz refresh rate provides rock-solid stability.

Fast Screen Update.
With over a million pixels, screen updating can get sluggish on some monitors. The Viking 1 accelerates screen update by avoiding processor wait states.

Gets Your SE Involved.
With most large-screen monitors, your Macintosh is turned off–or just a repository for surplus windows and toolboxes. With the Viking 1, your Mac SE can serve as a 7x11-inch scrollable extension to the large-screen image. Or "roam and zoom" in the large-screen image, zooming in at two levels of "fat bits" magnification of whatever the cursor is pointing to.

IBM® Compatibility.
The Viking 1 is the only monitor that's compatible with both the Macintosh SE and the entire IBM line of PC/XT/AT and PS/2 computers. So you can stay flexible and grow.

*Jim Seymour, *PC Week* **Jim Felici, *Publish!*

Macintosh is a trademark of McIntosh Laboratories Inc. IBM is a registered trademark of International Business Machines Corporation. "Publishing Resolution" is a trademark of Moniterm Corporation.

Spend A Minute With Moniterm.



That's all it takes to *really* visualize the benefits of the **Viking 1.** For a screening, contact the dealer in your area, or return this card for more information.

Name_____
Company_____
Street_____
City_____ **State**_____ **Zip**_____
Tel. No._____
Dealer Inquiries Wanted.

MONITERM

Moniterm Corporation
5740 Green Circle Drive
Minnetonka, MN 55343
(612) 935-4151
TELEX–753626
FAX–(612)933-5701

Circle 779 on reader service card

Icon Review's Prices Are Made to Order

Enlarge Your Mac's Screen 526%



MegaScreen II

From MegaGraphics

MegaScreen opens up a whole new world for desktop publishing, CAD, spreadsheet preparation, graphics, and project planning. Its 19.5" monitor preserves the Mac screen's 75 dpi pixel density, but is five times larger! Spreadsheet users will be able to see a whole year's worth of data at once, and desktop publishers can work on two-page spreads without scrolling.

The MegaScreen is designed for easy clip-on installation with no soldering required. And unlike the software that comes with many large-screen monitors, MegaScreen's comes packed with special features that let you do more than just double-click an icon to boot the screen. The utility software gives you precise control over resolution and refresh rate, and MegaScreen comes with an electronic mail program and *MegaZoom*, a program that causes the Mac screen to function normally while the MegaScreen displays the same smooth image, four times larger — ideal for demonstration/display or as an aid for the visually impaired.

Why put up with small-screen tunnel vision? Order MegaScreen today.

1850 • *Works w/512E & Mac Plus only; MegaScreen SE*M (#2096) works w/SE only; installation by qualified technician recommended*

$1,499

Inside

More New Products

Your Resource for Select Macintosh Products

MegaScreen now has full dual-screen capability with any standard application, giving you easy access to Scrapbooks or Toolboxes without sacrificing work space.

Icon Review is a consumer-direct marketing company that specializes in quality hardware, software, and accessories for the Apple Macintosh. We have built our reputation as a reliable and friendly supplier of the latest and best Mac-related products.

Put Icon Review to work for you and take advantage of our extensive research in the Mac marketplace. Each and every product we carry is evaluated for quality and value, then offered at the lowest possible discount price. Pick up the phone and order today.

You'll be glad you did!

MEMBER DIRECT MARKETING ASSOCIATION

Icon Review

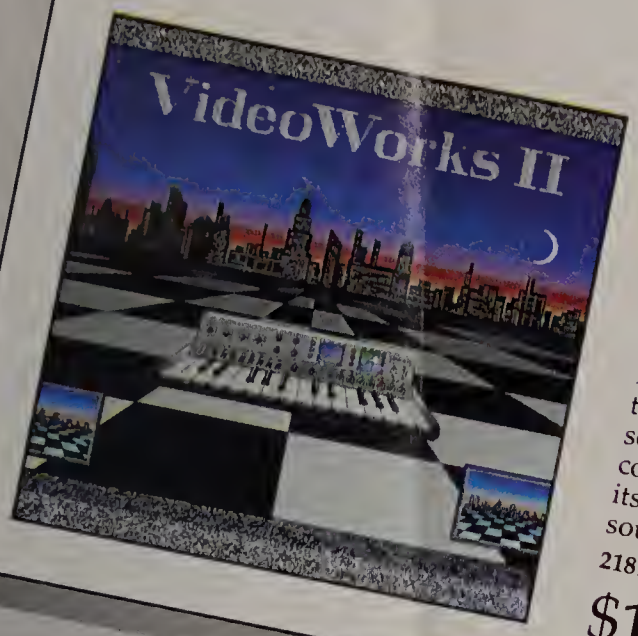
800/228-8910

Good anywhere in U.S.

408/625-0465

VideoWorks II

From MacroMind, Inc.



How can you move your audience if your Mac images just sit there? VideoWorks II makes it easier than ever to add the sound and motion that create dynamic business presentations, animated educational courseware, and effective point-of-sale displays.

New version makes it simple to combine images from virtually any program into a slide show; add fancy transitions (dissolve, fade, wipe, etc.), insert animated clip art, include movies, overlay text on slides or movies, and incorporate color on the Mac II and even comes with its own library of ready-to-use movies, sounds, artwork, and animated clip art.

2181 • *Works w/Mac 512K, Mac Plus, SE & II*

$125

FREE Catalog

Order yours today and save money on more than 400 Mac products.

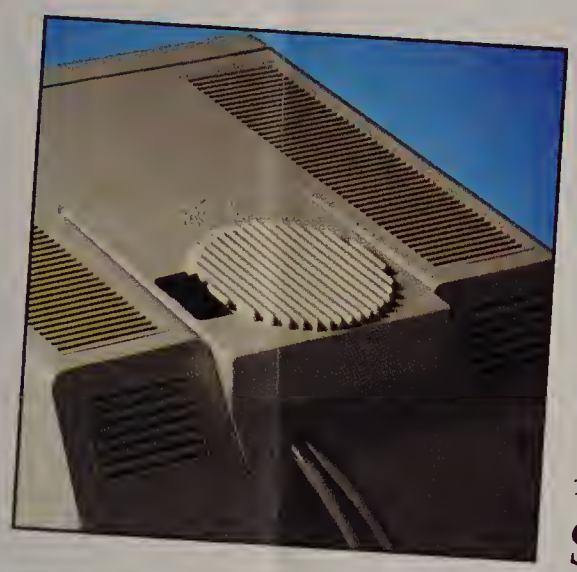
Call

800/228-8910



Fanny Mac

From Beck-Tech



Avoid system burnout with Fanny Mac. This dependable fan reduces your Mac's operating temperature as much as 50° and has a built-in surge suppressor to keep your data safe from destructive power surges.

Efficient and convenient, Fanny Mac moves air through your Mac at 24 cubic feet/minute and comes with a "pass-through" power assembly that lets you use one power socket for both Mac and fan.

And it's built to last — ball-bearing construction keeps Fanny Mac on the job twice as long as sleeve-bearing fans. Lightweight and compact, all this protection fits neatly into the handle of your Mac and pops out quickly for easy transport. Prolong the life of your Mac with Fanny Mac.

Works w/128K, 512K, Mac Plus & SE

1296 • Beige **2102 • Platinum**

$59

Tempo 1.2

From Affinity Microsystems



What will you do with all the time you save using Tempo macros?

Use Tempo to automate time-consuming operations in almost any application. Simply record your activities (such as entering text or clicking on menu commands), then replay the sequence as one command. Insert boilerplate text, format lengthy documents, or move data among programs with simple Command-keystrokes. We use Tempo with PageMaker to automate routine type formatting. By assigning keystrokes to sequences of point size, leading, and tabs, we avoid thousands of tedious manual commands.

New Tempo 1.2 lets you assign additional macros to the function keys on most extended keyboards.

1307 • *Works w/512K, Mac Plus, SE & II*

$53

Orders

800/228-8910

Good anywhere in U.S.

Monday thru Friday 6 am to 7 pm
Saturdays 8 am to 4 pm (Pacific Time)

408/625-0465

POLICIES: We accept MasterCard and VISA with no added service charge. Your credit card is charged for the full amount of your order when your order enters our system so that we can reserve your products at the prices quoted. Personal and company checks accepted; for faster delivery, send certified check, cashier's check, or money order. Sorry, we can't accept COD's.

- We accept corporate and school Purchase Orders (for a minimum of $250 for initial orders, $100 for subsequent orders) upon approval of credit.
- California residents, please add 6% sales tax to your order.

GUARANTEE: All products shipped by Icon Review are new and guaranteed by the manufacturer to work. All defective merchandise will be repaired or replaced by the manufacturer. **Icon Review cannot guarantee machine or color compatibility.** Please select your merchandise carefully.

TECHNICAL SUPPORT: Need more information? Icon Review maintains a technical support team for your convenience. Call (408) 625-0465 if you need help — before or after ordering.

CHANGES & CANCELLATIONS: You may change or cancel your order at any time prior to shipment. Subject to availability, orders are usually shipped within 48 hours; priority orders are shipped the same day if received before 2 pm PST.

RETURNS: All returns require a Returned Merchandise Authorization (RMA). Phone 800/228-8910 to receive your RMA. **All returns must be complete, including all original warranties, manuals, documentation, and packaging.** Please include a copy of your invoice or packing slip and a description of the problem. Due to software copyright laws, all sales are final. **No returns authorized after 30 days from date of shipment, and no returns accepted without an RMA.**

SHIPPING & HANDLING: A shipping and handling charge will be added to your order.

Domestic Service - 48 States & Canada
We will ship your products by UPS or US Mail Surface unless you specify otherwise; Second-Day Air Service to Hawaii, Puerto Rico, Alaska; Priority Next-Day Air Service, be sure to have our salesperson check stock. Priority backorders are shipped Second-Day Air.

International Service
We serve most European locations (served by UPS) — including U.K., Scandinavia, France, Italy, Germany & Japan — $40.00 minimum shipping & handling charge or 21% of the total purchase price, whichever is greater We also serve Africa, Australia, Spain, Portugal, Mexico, South America, Philippines, etc. — write or phone for rates.

All prices, specifications, and availability subject to change without notice.

Macintosh is a trademark licensed to Apple Computer, Inc.
Icon Review, 9570 Mid Valley Center, Carmel, CA 93923
© 1987 Icon Review

STOCK #	PRODUCT NAME		PRICE

SOFTWARE

	Adobe Fonts		
	We carry all Adobe Fonts; call to order		
2186	AffiniFile	NEW	$ 59
1840	Business $ense	SPECIAL	$ 259
1817	CalendarMaker		$ 35
2106	Canvas	NEW	$ 119
2107	• Canvas DA only	NEW	$ 64
1911	C.A.T.		$Call
1889	Certificate Maker		$ 42
2168	CheckMark Payroll		$ 199
	ClickArt		
	We carry all T/Maker ClickArt ; call to order		
2103	Coach 3.0	NEW	$ 62
2108	• Coach Thesaurus	NEW	$ 39
2104	• Coach Professional	NEW	$ 119
2179	• Coach Prof. Network	NEW	$ 299
1523	Colormate		$ 48
1503	Colormate Art		$ 29
1444	ColorPrint		$ 25



Is your new SE giving you a pain in the neck? **MacTilt for Mac SE** elevates your screen 4", tilts it 30°, or rotates it 360° with the touch of a finger.

1943 • From Ergotron

$74

2145	Comic Strip Factory	NEW	$ 55
2105	Comment	NEW	$ 64
1485	Concertware Midi		$ 99
1097	Concertware Plus		$ 49
1012	Copy II Mac		$ 25
1696	Cricket Draw		$ 175
1335	Cricket Graph		$ 125
2174	DA-Switcher	NEW	$ 29
1211	Deluxe Music Constr'tn. Set		$ 74
1868	Dinner at 8 Bundle	SPECIAL	$ 49
1856	Disk Express	SPECIAL	$ 25
1912	DiskFit		$ 49
2048	• Network DiskFit		$ 279
1913	Disk Quick		$ 27
2211	Double Helix II	NEW	$Call
1346	Easy3D		$ 89
1013	Electric Checkbook	SPECIAL	$ 27
2200	Eureka	NEW	$Call
2141	Expressionist	NEW	$ 59
1737	FactFinder		$ 49
2217	Fastback for Mac	NEW	$Call
1664	FileMaker Plus		$ 195
2049	Findswell		$ 39
1018	Fluent Fonts		$ 29
	Fluent Laser Fonts	EACH	$ 48
1403	FullPaint	SPECIAL	$ 49
1890	Geometry		$ 64
1705	Glue	SPECIAL	$ 39
2171	GridMaker	NEW	$ 34
1629	Hard Disk Backup		$ 39
1732	Hard Disk Partition		$ 39
1269	Hard Disk Utility		$ 57
1675	HFS Backup from PCPC		$ 29
1987	Illustrator		$Call
1095	In-House Accountant	SPECIAL	$ 99
1799	Japanese Clip Art/Scroll I		$ 65
1800	Japanese Clip Art/Scroll II		$ 65
2090	Laser Author		$ 105
2152	LaserFX	NEW	$ 139
1707	LaserServe (per user)		$ 64
1581	LightspeedC		$ 125
1708	Lightspeed Pascal	SPECIAL	$ 85
2115	Lookup	NEW	$ 39
2074	MacAtlas Professional		$ 129
1818	MacBillboard		$ 24
1995	MacCalc		$ 85
1082	MacDraft 1.2		$ 159
1918	MacGraphics		$ 149
2047	MacInUse 2.0		$ 55
1023	MacLabeler		$ 29
1803	MacMoney	SPECIAL	$ 40
1668	MacMovies		$ 79
1710	MacProof		$ 99
1695	Mac3D	SPECIAL	$ 119
1105	Mac Zap		$ 39
1986	MapMaker		$ 179
2196	McMax	NEW	$ 219
2149	MergeWrite	NEW	$ 32
1397	Micro Planner Plus		$ 299
	Microsoft		
	We carry all Microsoft products; call to order		
1200	MindWrite	SPECIAL	$ 159
1819	MockPackage Plus		$ 24
1641	MORE		$ 159
2144	MultiUser Appt. Diary	NEW	$ 89
	Notes...	EACH	$ 42
	For Excel, PageMaker 2.0, Works & Word 3.0		
2153	Omni Backup		$ 69
2051	101 Macros for Excel	SPECIAL	$ 49
2137	OnLine Companion		$ 34
1036	OverVUE 2.0		$ 149
1478	• Mail Manager		$ 29
1477	• Personal Finance		$ 29
1490	PictureBase	SPECIAL	$ 59
2068	PowerPoint		$ 279
1215	Print Shop	SPECIAL	$ 37
1505	Printworks		$ 49
1254	Professional Bibliographics		$ 199
1658	Pro3D		$ 199
2213	QuickDEX	NEW	$Call
1728	Ragtime		$ 239
1798	RAM Snap	SPECIAL	$ 20
2173	Read-It!	NEW	$ 165
2172	• Read-It ThunderScan	NEW	$ 85
1763	ReadySetGo!4	NEW	$Call
2150	Record Holder Plus	NEW	$ 45
2084	Reflex Plus	NEW	$ 189
2083	ResuméWriter		$ 28
2215	Scoop	NEW	$Call
2069	Sentinel		$ 109
1863	SideKick 2.0		$ 62
1488	Silicon Press		$ 48



Get it all with **Canvas** — the dot-by-dot control of Paint, Draw flexibility, *and* PostScript in a single document!

Includes both application & DA version; works w/512E, Mac Plus, SE & II

2106 • From Deneba Software

$119

1465	Smart Alarms	SPECIAL	$ 37
1857	SmartScrap & Clipper	SPECIAL	$ 39
1365	Spellswell	SPECIAL	$ 49
2050	• Legal Dictionary		$ 59
1936	• Medical Dictionary		$ 59
1060	StatWorks 1.3	SPECIAL	$ 75
1848	Stella for Business		$ 259
1937	Stepping Out	SPECIAL	$ 57
2218	Suitcase	NEW	$Call
2151	SuperGlue	NEW	$ 69
1811	Super LaserSpool		$ 99
1938	• Super LaserSpool/Multi		$ 259
1720	SuperPaint		$ 89
1810	SuperSpool		$ 49
2210	Super 3D	NEW	$Call
1307	Tempo 1.2	SPECIAL	$ 53
1804	Thunder 1.1		$ 34
1432	TopDesk		$ 35
1847	Trapeze		$Call
1721	Turbo Pascal		$ 62
2181	VideoWorks II	NEW	$ 125
2216	V.I.P.	NEW	$Call
2091	VLS Bulk Mailer		$ 159
1377	WillWriter	SPECIAL	$ 30
2132	Word Finder	NEW	$ 39



Transfer IBM dBase III Plus files to your Mac and run them up to ten times faster with **McMax**.

Works w/512E, Plus, SE & II; requires MacLink Plus or other serial connection

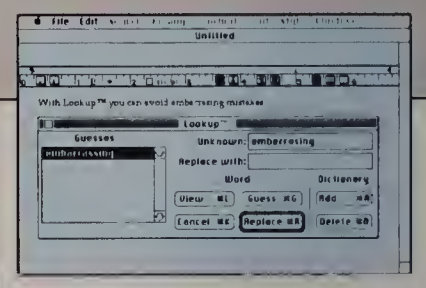
2196 • From Nantucket

$219

1480	WordTools		$ 49
1839	WorksPlus Spell	SPECIAL	$ 38
1694	WriteNow		$ 99

EDUCATION/GAMES

	Books		
2117	• *Graphics Guide for DTP*		$ 14
1905	• *How to Write Mac Software*		$ 24
2214	• *HyperCard Handbook*	NEW	$Call
2133	• *Inside Macintosh/Vol I*	NEW	$ 23
2134	• *Inside Macintosh/Vol II*	NEW	$ 23
2135	• *Inside Macintosh/Vol III*	NEW	$ 19
2136	• *Inside Macintosh/Vol IV*	NEW	$ 23
1908	• *MacAccess*		$ 19
1690	• *Macintosh Advisor*		$ 15
1893	• *Macintosh Bible*		$ 16
2175	• *MS Word for the Mac*	NEW	$ 16
1910	• *Personal Publishing*		$ 21
2176	• *Run Your Business w/Excel*	NEW	$ 16
2146	Bureaucracy	NEW	$ 25
2052	Business Simulator	SPECIAL	$ 49
1761	Dark Castle		$ 32
	First Byte Games		$ 36
	We carry all First Byte programs; call to order		
1559	Flight Simulator		$ 32
1685	Grand Slam Tennis		$ 27
1475	KidsTime		$ 29
1652	MacGolf		$ 49
	MacKids Games		$ 24
	We carry all MacKids programs; call to order		



Keep your text letter perfect with **Lookup**, an easy-to-use DA that lets you use phonetics or wild-card guesses to search for the correct spelling of words.

Works w/512K, Mac Plus, SE & II

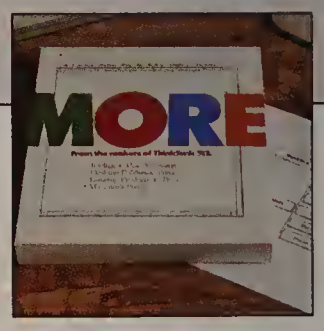
2115 • From Working Software

$39

1776	Mac Pro Football	NEW	$ 32
1233	Math Blaster		$ 32
2208	Rainy Day Games	NEW	$Call
2142	Shadowgate	NEW	$ 34
2138	Smart Eyes	NEW	$ 49
2139	Smart Words/Business	NEW	$ 49
2140	Smart Words/College	NEW	$ 49
1869	Smash Hit Racquetball		$ 18
2147	Sub Battle Simulator	NEW	$ 24
1766	Toy Shop		$ 39
1047	Typing Made Easy		$ 32

COMMUNICATIONS

	Avatex Modems		
2157	• Avatex 1200	NEW	$ 139
2158	• Avatex 2400	NEW	$ 269
2159	Capetronic 1200 bps	NEW	$ 129
	Wall Mount Modem		
1460	CompuServe Subscription Kit		$ 23
2123	ComServe	NEW	$ 129
1801	Direct 1200 Modem	SPECIAL	$ 119
2053	EMAC 2400 Modem	NEW	$ 269
	Hayes – *We carry all Hayes products*		$Call
1437	InBox Starter Kit	SPECIAL	$ 239
1593	• InBox Personal Connection		$ 89
1973	inTalk	SPECIAL	$ 149
1132	MacEnhancer		$ 175
1731	MacLink Plus w/8' Cable		$ 159
1396	MacServe (per server)	SPECIAL	$ 159
2046	MicroPhone 1.1		$ 119
2063	Modular Cable Kit		$ 99
	500' phone cable, 100 connectors & crimping tool for do-it-yourself network connections		
2148	NetModem V1200	NEW	$ 489
	PhoneNet Networking Products		
1739	• For 128 & 512K /E		$ 49



Anyone who needs to create outlines, manage schedules, or transform ideas into presentation graphics will benefit from the power of **MORE**.

Works w/512K, Plus & 2nd drive, SE & II

1641 • From Living Videotext

$159

1740	• For Mac Plus, SE & II		$ 49
1765	• AppleTalk Adapter		$ 8
2006	Pocket Modem	SPECIAL	$ 169

HARDWARE

1142	A+ Mouse		$ 79
2219	• A+ Mouse ADB		$ 99
1902	AST TurboScan		$ Call
2003	Datacopy Scanner 730		$1589
2093	• Document Feeder		$ 459
2004	• Software & Interface		$ 599
	Dove Computer Corp.		
	We carry MacSnap Upgrades; call to order		
	Kurta Graphics Tablets	ON SALE	
1900	• IS/One (12 x 12)		$ 649
1898	• IS Penmouse (6 x 9)		$ 199
1946	• IBM XT Interface Kit		$ 39
	Call to order extra input devices		
1452	MacBuffer/256K		$ 249
1451	• MacBuffer/512K		$ 329
1450	• MacBuffer/1024K		$ 429
1966	Mac 101 Keybd/Bge	SPECIAL	$ 159
2059	• Mac 101 ADB for SE or II		$ 159
1207	MacVision		$ 175



Don't put your mouse down just anywhere! Antistatic **Mouspads** from Moustrak help your mouse stay cleaner, move faster, last longer.

1143 • 7" x 9" Mouspad $8

1525 • 9" x 11" Mouspad $9

	MegaGraphics		
2092	• CineMac Composite Card		$ 79
2095	• MegaModule Card		$ 79
2096	• MegaScreen SE*M (19.5")		$1499
	Works w/SE only		
1850	• MegaScreen II (19.5")		$1499
	Works w/512K & Mac Plus only		
	MinuteMan Power Supplies		
1866	• MinuteMan 250		$ 289
1867	• MinuteMan 300SS		$ 439
2118	• MinuteMan 600SS	NEW	$ 739
1806	Neos Mouse		$ 49
1718	PC MacKey		$ 119
1724	quadLYNX Trackball		$ 99
1835	QuickStick		$ 49
1997	ScripTEN 3MB PostScript Printer		$4295
	We carry all ScripTEN accessones & supplies		
1871	Seikosha Printer		$ 229
1141	• Printer Stand		$ 17
1935	• Ribbon for Seikosha		$ 8
1054	ThunderScan 4.0	SPECIAL	$ 199
1570	• T'Scan to Plus/SE Adapter		$ 49
	Needed for earlier versions only		
2166	UltraScan Monitor	NEW	$ 749
2167	• UltraScan Cable		$ 49

DISK DRIVES

1906	Bering 20+20 Cart Drive		$2295
	We carry accessories for your Bering Drives		
	CMS SCSI Drives		
1971	• Compact S20A		$ 599
1970	• Compact SC40		$ Call



Put your database or spreadsheet report on the map with **MapMaker**, a powerful statistical mapping program for presentation graphics.

Works w/512K, Mac Plus, SE & II

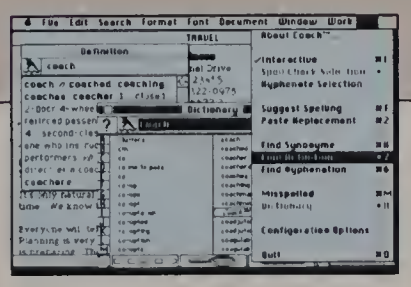
1986 • From Select Micro Systems

$179

1969	• MacStack SD20		$ Call
1968	• MacStack SD43		$ Call
1967	• Pro 40 SE Internal Drive		$ Call
2124	• Pro 40 II Internal Drive		$ Call
2085	• S-140		$2795
2086	• S-240		$3995
2087	• S-320		$5295
1972	• SE Internal Cabinet Kit		$ 149
	MacBottom Drives		
1323	• HD 20 Serial/Beige	SPECIAL	$ 859
1653	• HD 21 SCSI/Beige	SPECIAL	$ 799
1843	• HD 21M/Beige	SPECIAL	$ 949
1842	• HD 45 SCSI/Beige	SPECIAL	$1199
1845	• HD 45M/Beige	SPECIAL	$1349
1846	• Modem Upgrade/Beige		$ 189
	All drives available in platinum; call to order		
2185	MicroMAC 800K Drive	NEW	$ 184
	NuData SCSI Drives		
2154	• Data Cell 40/40T	NEW	$1999
2155	• Data Cell 90	NEW	$1899
2156	• Data File 40T	NEW	$ 999

ACCESSORIES

2079	AnthroCart		$ 249
2160	• Document Holder		$ 39
2080	• Side Car Printer Stand		$ 189
2081	• Slide-out Shelf		$ 89
2082	• Storage Basket		$ 53
	Backup Cassettes		$18-28
	We carry cartridges to fit most tape backups		
	Cables		$15-40
	We have a full line of quality cables; call to order		
	Carrying Cases		
1631	• For ImageWriter I & II		$ 69
1644	• For Mac & Mac Plus		$ 89



Sharpen your writing with **Coach Professional** DA. Uses Webster's dictionary/thesaurus to check spelling, list definitions and synonyms, hyphenate, and more.

Works w/512K, Mac Plus, SE & II

2104 • From Deneba

$119

	Copy Holders		
1882	• Desktop (8 1/2 x 11)		$ 12
1883	• Desktop/Wide (11 x 17)		$ 19
1884	• SpaceSaver (8 1/2 x 11)		$ 28
1769	Data Switch/128 & 512K Mac		$ 29
1820	Data Switch/Plus, SE & II		$ 39
	Disk Holders		
1387	• disk•book-10		$ 12
1399	• disk•book-32		$ 22
1572	• disk•book-Plus (16)		$ 20
1032	• Fellowes Disk Holder		$ 16
1033	• Fellowes w/Lock		$ 18
1597	• Mahogany Disk Holder		$ 28
1815	• Rolltop Cabinet/45		$ 15
1816	• Rolltop Cabinet/90		$ 24
1781	• Traveller-4		$ 5
1780	• Traveller-8		$ 7
1779	• Traveller-12		$ 9
	Dust Covers		
1406	• External Drive Cover		$ 7



The **3 MB ScripTEN Laser Printer** delivers quality output, costs less than the LaserWriter, and prints 20% faster!

Works w/all Macs; requires AppleTalk connection or equivalent; 6-month warranty

1997 • From Qume

$4,295

1407	• IW (standard) Cover		$ 11
1408	• IW (wide) Cover		$ 13
1410	• IW II Cover		$ 11
1411	• LaserWriter Cover		$ 17
1404	• Mac & Keyboard Cover		$ 15
1409	• Mac Plus & Keyboard Cover		$ 15
1296	Fanny Mac/Beige		$ 59
2102	Fanny Mac/Platinum	NEW	$ 59
2183	Fastpad	NEW	$ 12
1402	Head & Scrn Cleaner	SPECIAL	$ 15
	ImageWriter Ribbons		
1876	• Black	EACH	$ 4
1643B	• 4-Color (IW II)	EACH	$ 12
	Single ribbons also available in blue, green, red, or yellow; call to order		
	Kensington		
	We carry all Kensington products; call to order		
	Laser Cartridges		
	We carry new and reconditioned cartridges; call to order		
1283	MacCracker		$ 20
2182	Mac DayDreams	NEW	$ 10
	Four-color, 12" x 24" 12-month wall calendar		
1527	MacInker (IW I & II dedicated)		$ 44
	Call to order ink and rollers		
1650	Mac 'N' Frost/Beige		$ 59
2114	Mac 'N' Frost/Platinum		$ 59
1029	MacTilt	SPECIAL	$ 74
2071	• MacTilt/Platinum	SPECIAL	$ 74
1832	• MacTilt for Large Screen		$ 89
1943	• MacTilt for Mac SE	SPECIAL	$ 74
1977	Mouse Cleaner 360°		$ 15
1143	Mouspad (7 x 9)		$ 8
1525	Mouspad (9 x 11)		$ 9
1834	Power Director		$ 66
1813	PowerLine One		$ 9
1814	PowerLine Six		$ 33



Dinner at Eight w/Silver Palate features recipes from famous chefs (or add your own). It calculates the ingredients for number of servings, prints shopping lists, and even suggests suitable wines!

Works w/512K, Mac Plus, SE & II; external drive recommended.

1868 • From Rubicon

$49

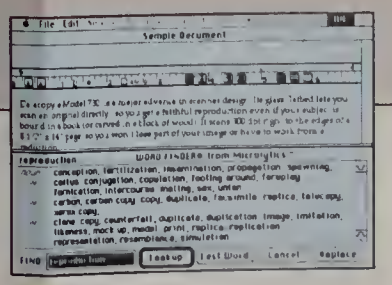
1498	PowerLine Strip		$ 39
1657	SCSI Terminator		$ 49
2097	System Sweeper		$ 37

SONY DISKETTES

1144	Diskettes SS/DD-10		$ 12
1344	Diskettes DS/DD-10		$ 18
2072	Diskettes SS/DD-50	SPECIAL	$ 58
2073	Diskettes DS/DD-50	SPECIAL	$ 84

Wait! This isn't really the end. We carry many more products than we're able to list, and new ones are coming in all the time. If you don't see something you're looking for, call to ask.

Prices and availability are subject to change without notice.
NOTE: These prices do not include shipping/handling charges; please call for rates.



You'll never be at a loss for words again with **Word Finder**, the electronic thesaurus DA that puts 220,000 synonyms at your fingertips.

Works w/512K, Plus, SE & II; supports most Mac software

2132 • From Microlytics, Inc.

$39



800/228-8910

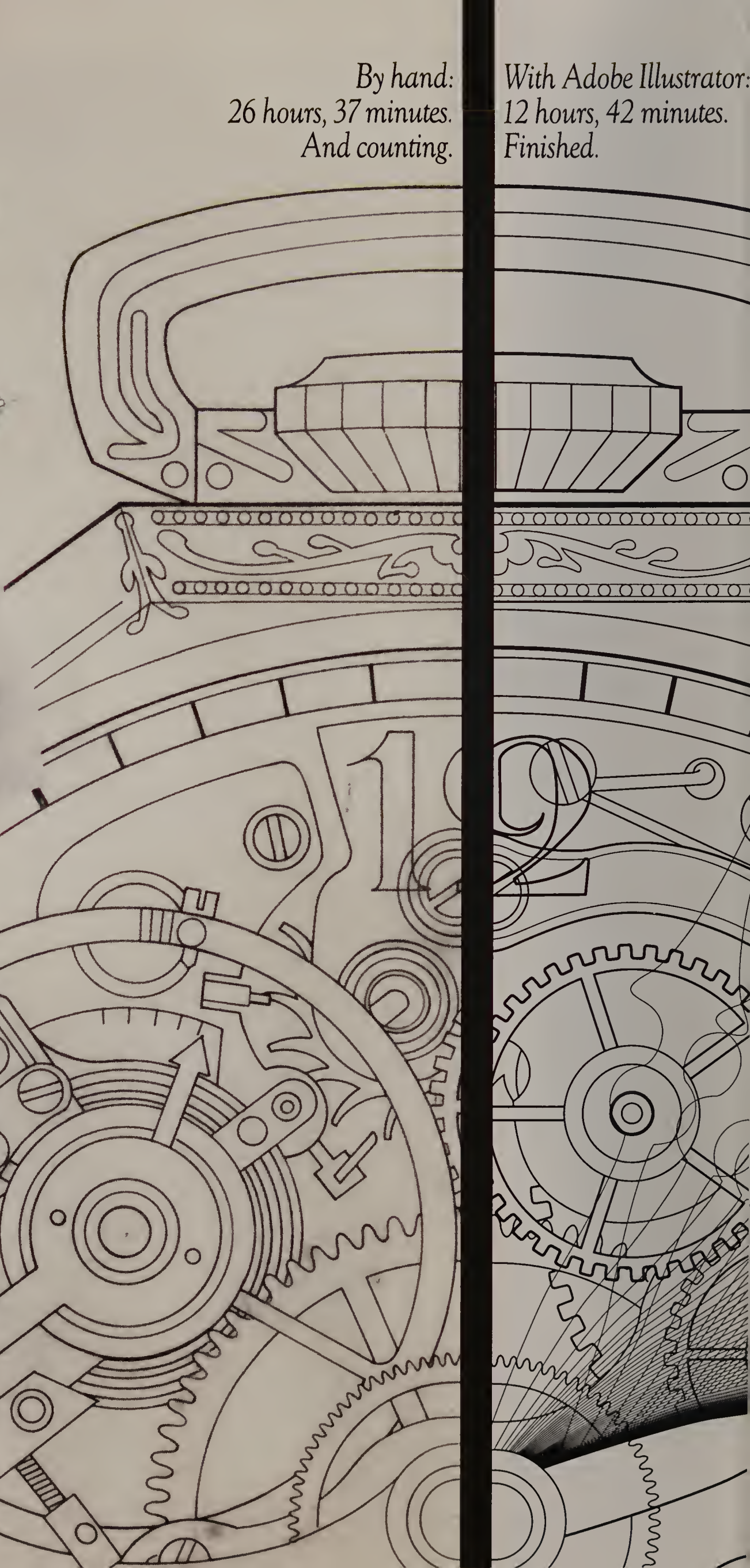
Good anywhere in U.S

Circle 272 on reader service card

By hand:
26 hours, 37 minutes.
And counting.

With Adobe Illustrator:
12 hours, 42 minutes.
Finished.







The art of Adobe Illustrator.

This side-by-side comparison demonstrates the power, productivity and art of Adobe Illustrator.™

On both sides, the artist started with a rough sketch which he traced over. (Adobe Illustrator allows you to trace over other kinds of existing art, as well.)

After that, all similarities end.

The Adobe Illustrator side is not only finished, it's cleaner, sharper, and includes details—like the strobe effect on the minute hand and maddeningly precise little circles on the rim— that simply can't be duplicated by hand.



To get these effects with Adobe Illustrator, you simply draw, step, and repeat the desired shape in whatever position or angle or size you like.

For example, the artist drew a single gear, then resized it and put it in different places. And Adobe Illustrator held the desired line weight regardless of image size.

You can also rotate, add type, combine one image with another, share images with other users, or even incorporate images into the most popular page layout programs.

Finally, with Adobe Illustrator, you can edit your drawing and get new art in minutes. Which beats opaquing any day.

Just pull down a menu and tell your Macintosh Plus, SE, or II to "print." And get camera-ready art out of any POSTSCRIPT®-equipped printer from a 300-dpi laser printer to a 2540-dpi typesetter.

Call us at (800) 29-ADOBE, or (415) 962-2100 from Alaska or Canada.

So you can find out where to see and buy the Adobe Illustrator before any more time goes by.



Adobe Illustrator

Now a work of art doesn't have to be a lot of work.

Adobe Illustrator is a trademark and POSTSCRIPT is a registered trademark of Adobe Systems Incorporated
Other brand or product names are trademarks or registered trademarks of their respective holders. © 1987 Adobe Systems Incorporated, 1585 Charleston Rd., Mountain View, CA 94039-7900.

ADOBE SYSTEMS INCORPORATED

You'll notice the side done by hand is unfinished and not nearly as crisp as the Adobe Illustrator side. That wasn't done on purpose. Both sides were done by the same talented artist, Jeffery West of Jeffery West Design, who, until recently taking up Adobe Illustrator, made his living with pen-and-ink.

Circle 678 on reader service card

Totem II.
A little drive goes a long way.



In this era of tight desk real estate and massive storage requirements, our new Totem II disk drive can do a lot to make your life (or business) a whole lot simpler.

Like our other Totem drives, Totem II uses removable cartridges that offer super high capacity —a whopping 20 megabytes.

Which is roughly 25 times the storage you can expect from a standard floppy. And at least 5,000 more pages than you can store on comparable removable media.

Not bad for a little guy that stands a mere three inches tall.

And, you'll be pleased to notice that Totem II is priced for budget-conscious Apple users. At such a low cost per megabyte, you won't have to feel guilty about storing all those space-grabbing projects.

You can organize all your desktop publishing, accounting, music, graphics, writing or business files with far greater ease and in much less time.

Because at 37 ms, our Totem cartridges let you access files much faster than any other high-capacity floppies.

Furthermore, Totem cartridges incorporate the same durable, Bernoulli technology that for the past two years has already proven itself to our Hewlett-Packard computer users throughout the world.

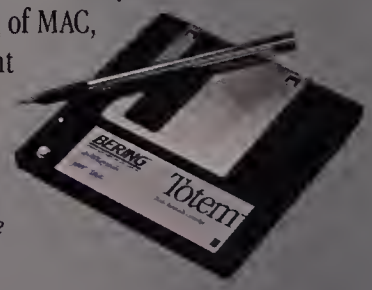
You won't have to worry about *securing* your files, either. Our totable, 5¼" cartridges can be locked in a safe or drawer, so sensitive information won't fall into the wrong hands.

	Totem II
Cartridge capacity	*20MB (10,000 pages)*
Media type	*Durable, long-lasting Bernoulli cartridges resist head crashes*
Access time	*37ms*
Warranty	*One year*
Price	*$1,195*

So if you're looking for extremely high reliability, you can rest assured your data is secure and won't get corrupted.

Circle 627 on reader service card

If you're looking for portability, you can tote our little 8-lb. Totem II drive in your briefcase or MAC bag. And speaking of MAC, Totem II fits neatly right under your MAC, MAC Plus or SE. It's MAC II-compatible, as well.



Each Totem cartridge holds 20MB of data.

For more information or for a copy of our latest brochure, call us now at 800 BERING 1 or 408 379-6900. Bering Industries, 240 Hacienda Avenue, Campbell, CA 95008.

BERING™

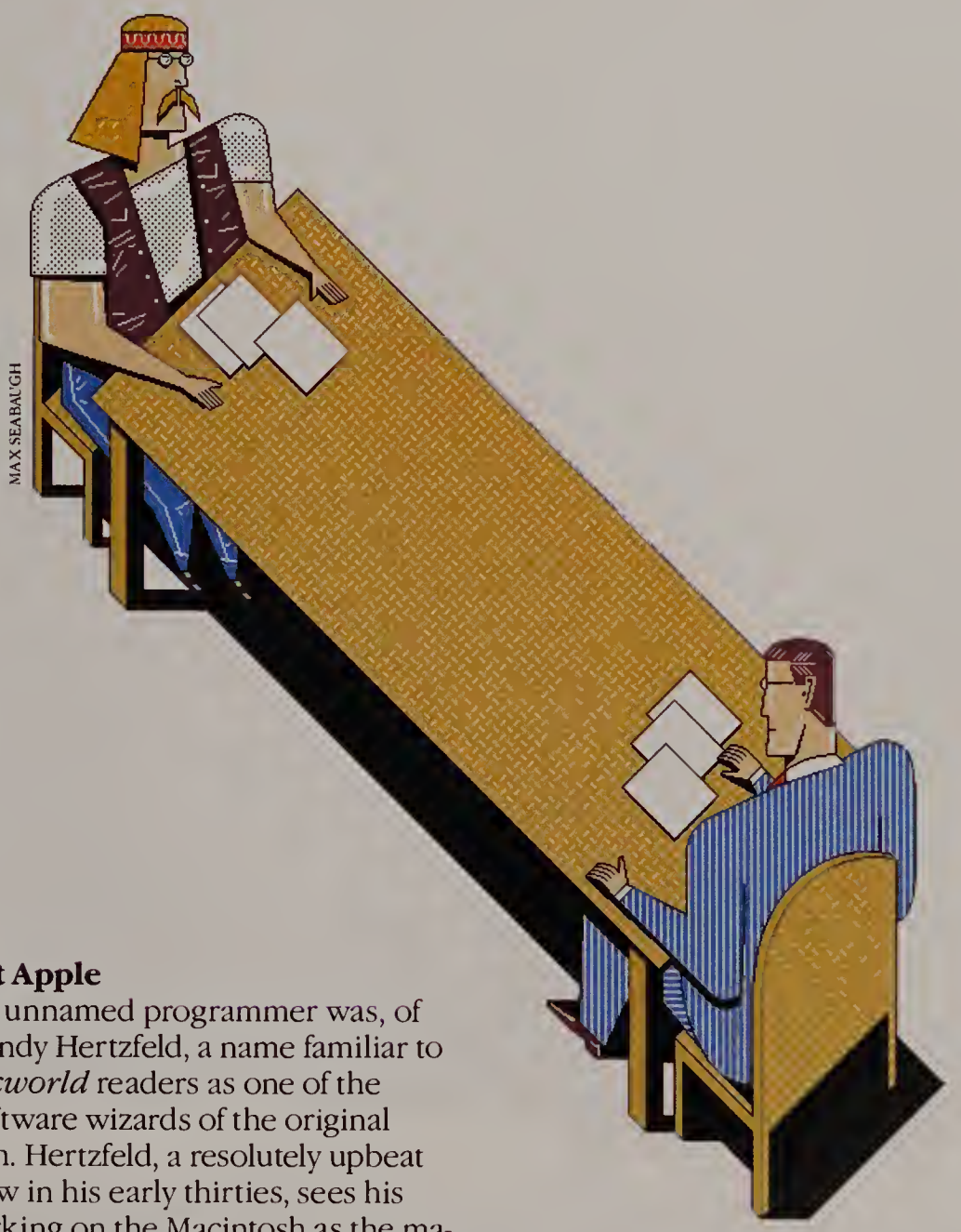
Totem and Totem II are trademarks of Bering Industries, Macintosh, MAC Plus, MAC SE and MAC II are tradenames of Apple Computer



Steven Levy

Tales of the MultiFinder

Behind the new system software is a controversy that cuts to Apple's core



MultiFinder made its debut at last summer's Macworld Expo, an event that will ultimately be remembered as the high-water mark of the Macintosh. The crowds were reminiscent of the 1982 Comdex, when people suddenly realized that microcomputers were not only real, but growing explosively, and those who got in then would reap big bucks. In 1987 the Bayside Convention Center was teeming with people in business suits who smelled money in the Mac.

The most talked-about product was *HyperCard,* which I'll discuss in another column. The most *important* product was MultiFinder. This program, a sort of super-Finder, provides the illusion (and, in many cases, the advantages) of running more than one program at a time; and it embodies the past, present, and future of the Macintosh. It has enabled Apple to smugly proclaim superiority over the IBM world, which can only promise a similar product sometime in the future. By that time, Apple executives hinted, an enhanced version of MultiFinder would preserve Macintosh's technological head start.

But the MultiFinder story, like the Apple Computer story itself, is bittersweet. Its resonances, its strengths and shortcomings, are, almost as if genetically determined, inextricably linked to the controversial Apple character. One could easily detect this heavy baggage when the product was introduced by Apple's technology czar, Jean Louis Gassée. The French-born executive felt compelled to insist that none of the programming code used in the MultiFinder was held in common with code written by a former Apple engineer for a similar program that had somehow gained notoriety. It was an odd remark, a seemingly gratuitous insult. But as we shall see, it cut to the truth of the matter.

Split Apple

That unnamed programmer was, of course, Andy Hertzfeld, a name familiar to most *Macworld* readers as one of the prime software wizards of the original Macintosh. Hertzfeld, a resolutely upbeat fellow now in his early thirties, sees his years working on the Macintosh as the major event in his life thus far, and he takes inordinate pleasure in seeing people make the most of the computer he helped to create. Andy Hertzfeld doesn't work at Apple anymore, but his Macintosh love affair has lingered; in the past few years he has devoted his talents to writing products that will enhance the Mac and help it in the marketplace.

While his goals would seem to match Apple Computer's, the company's relations with Hertzfeld have been ambivalent. Some personal clashes might have contributed to this, but the heart of the matter is that Andy represents the Old Apple of the hackers–flaky, scruffy, passionate, and irreverent. The New Apple sees itself as energetically committed, but also professional, reliable, well-dressed, and in tune with the needs of conglomerates and robber barons. The New Apple likes the luster of its rambunctious youth, but wants the world to know that it has grown up.

The other problem with Andy is that he is associated with the reign of Steve Jobs. The former chairman and cofounder is still Apple's unwelcome Ghost In The Machine, and no amount of success seems

(continues)

Now that there's an IRMA put your old ideas about m

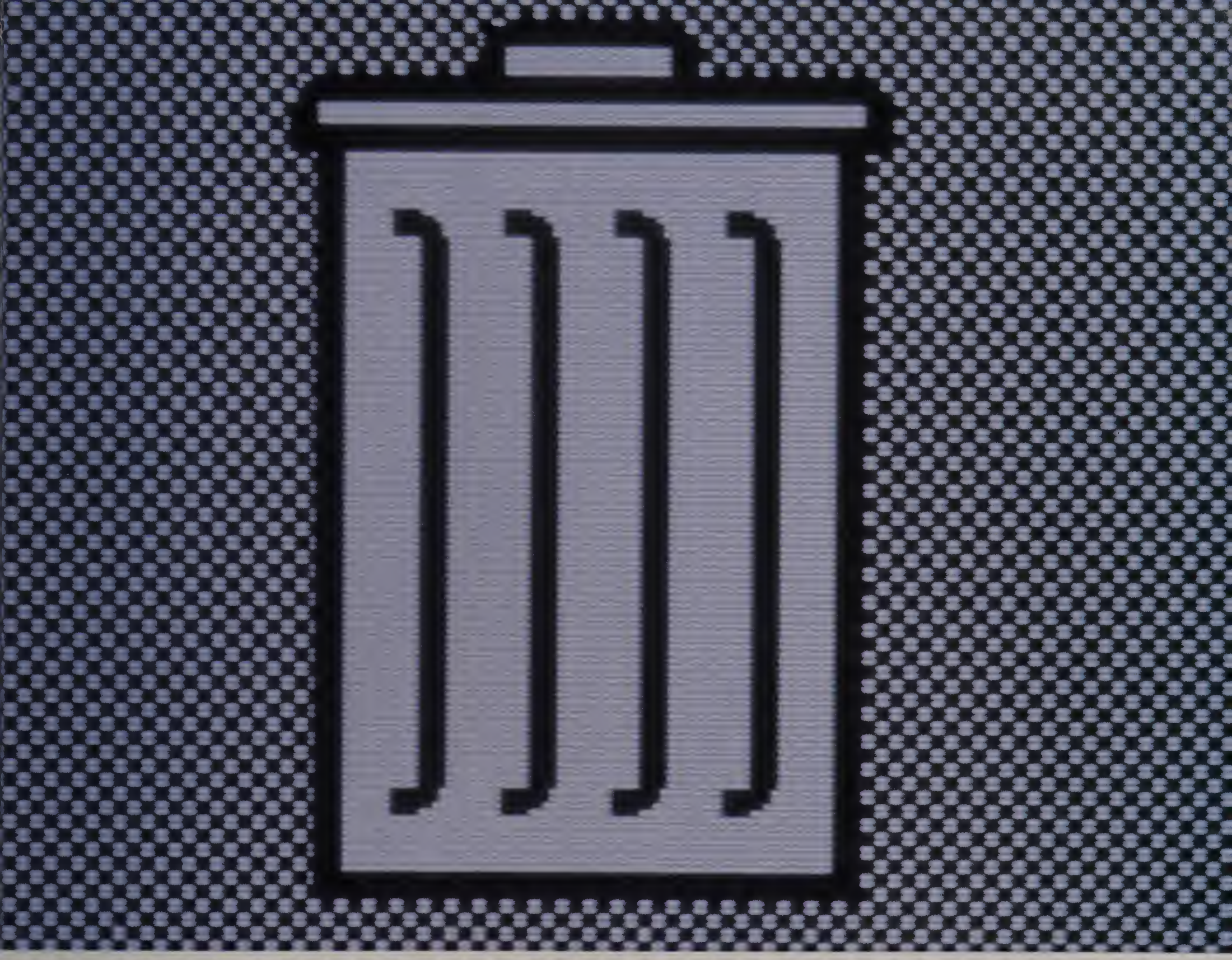
PC Coordinators have been debating the viability of Macintosh™-to-mainframe links for a couple of years now. With opinions varying from impeccable to impossible.

But no matter what ideas you might have on the subject, they are now old ideas.

Because DCA has introduced MacIRMA.™ And all the reliability and ease of use that made IRMA™ the PC-to-mainframe industry standard has come to the Macintosh II™ and Macintosh SE.™

How does that help you? Well, MacIRMA can support the DCA and IBM® mainframe file transfer software that you probably already have installed in TSO, CMS and CICS environments. Allowing you to actually offer

DCA is a registered trademark and MacIRMA and IRMA are trademarks of Digital Communications Associates, Inc. Macintosh, Macintosh SE, Macintosh II, Switcher and Multifinder



for the Macintosh, you can ainframe links in their place.

your users a choice of either Macintosh or IBM microcomputers while maintaining consistent 3270 connectivity.

And you can offer the same training and support to each of them regardless of which microcomputer they choose.

What's more, MacIRMA's 3270 emulation software is a true Macintosh application. It works with a "mouse," pull-down menus, is compatible with Switcher™ and Multifinder™ programs, and supports "copy-and-paste" to incorporate mainframe data into word processing or spreadsheets.

And that's just for starters. For the whole story, call DCA, toll-free, at 1-800-241-IRMA, ext. 535.

dca®

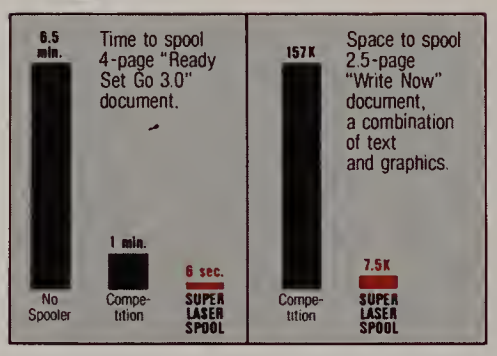
e trademarks of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corp. ©1987 Digital Communications Associates, Inc. All rights reserved.

Circle 616 on reader service card



BLINDINGLY FAST. By sending your print files to the background and returning control of your Mac to you, SuperLaserSpool lets you work and print at the same time. And it does this *5 to 40 times faster* than its nearest competitor.

SuperLaserSpool gets you back to work fast. You never wait for the printer, no matter how many documents you have queued up or even if the network is busy. SuperLaserSpool automatically manages the entire printing process while you work.



Look how much faster SuperLaserSpool will give your Mac back compared to its competition.

SuperLaserSpool's files are so small, you don't have to worry about running out of disk space.

WORKS WITH ANY APPLE® PRINTER. SuperLaserSpool can print to the LaserWriter and ImageWriter™ (either direct-connect or AppleTalk™-connected).

INCREDIBLY COMPACT. Other spoolers require so much storage space that a hard disk is essential. Not so with SuperLaserSpool. You can use it with floppy-disk systems because its files are so compact.

DOWNLOADED FONTS. Unlike most of its competitors, SuperLaserSpool can handle files that have multiple downloaded fonts.

EASY TO USE. With SuperLaserSpool, you can view all the jobs in the print queue, change their priorities, delete jobs, receive on-screen help, and check on network activity. Your spool files are always safe, even if the system crashes.

SuperLaserSpool works with almost all Macintosh applications. You can even leave and enter different programs without disrupting the printing of documents.

And it's completely invisible: You can launch it and forget it's even there.

- **SINGLE-USER: $149.95**
- **MULTI-USER: $395.00**

Get SuperLaserSpool at your local SuperMac dealer today, or order direct.

SUPERMAC SOFTWARE

950 N. Rengstorff, Mountain View, CA 94043
(415) 964-8884

Macintosh is a trademark licensed to Apple Computer, Inc. by McIntosh Laboratory, Inc.
LaserWriter, ImageWriter and AppleTalk are trademarks of Apple Computer, Inc. © 1986 SuperMac Software.

to be able to assuage the corporate Oedipal trauma.

A Switch in Time

What happened with MultiFinder illustrates the paradox. The program was really born from the limitations of the Finder, the file-handling program in the form of a desktop that was released with the original Mac. On early Macintoshes, closing down one program and opening another was a process that one did not undertake without setting aside some spare time. Competing computers did not have this problem, and it was something that, in certain eyes, damned the Macintosh to the status of a toy or curiosity. But no one really addressed that problem until Andy Hertzfeld, on a suggestion from writer John Markoff, hacked up a program called *Switcher.*

Switcher was originally a two-week project, done in time for the first Hacker's Conference in November 1984. Apple immediately saw the program's value, and Steve Jobs himself bought the program from Andy for $100,000 only minutes after viewing it. For Apple it was money well spent, as *Switcher,* in its various versions, became a terrifically useful, if not particularly robust, program.

By the next summer the Mac market was floundering. As Andy Hertzfeld roamed the sparsely attended aisles of the August 1985 Macworld Expo, he wondered what else he could do to help the Mac. He decided to rewrite the Finder, incorporating the features of *Switcher,* so the computer would be even easier to use and could more easily run several programs at once. So he set about writing a program to be called *Servant.* By the New Year he had it running. Indeed, it had multiple windows: you could open a program and then, by downscaling a window, see the desktop. From there, you could open another program, and another. Andy began to see how you could even do some multitasking–actually using one program (say a word processor) while a second program was performing a task (such as a communications program downloading a file).

Hertsfeld took *Servant* to Apple and showed it to the systems software group. There were gasps and buggy eyes–the previous day the group had set as its top 1986 priority to do a similar program. In no time Andy was negotiating to sell his work to Apple. The price this time was to be around $200,000. But Andy Hertzfeld was troubled. He had no confidence that the

(continues)

$39 Trial

Value Line's new software: For the complete investor.

Value Line's software lets you get the whole investment picture in clear focus.



Simply awesome —T.J.M.

Amazingly complete —B.A.L.

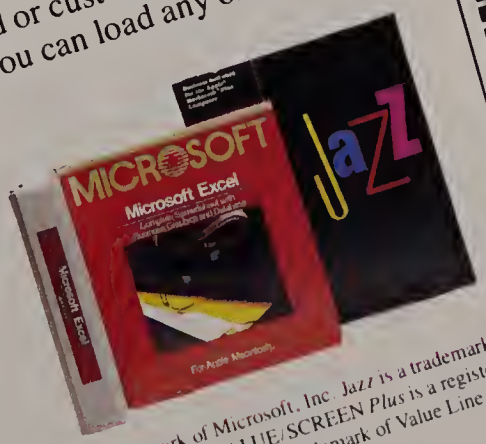
A quantum leap forward —J.A.H., Jr.

A valuable, easy-to-use, foolproof tool —C.R.R.

Well done and very useful—R.S.E.

Editor's Choice-*PC Magazine*

VALUE/SCREEN *Plus* packs a lot of investment power into one integrated investment package. ***Stock Selection:*** You can instantly screen the entire VALUE/SCREEN *Plus* database for all the stocks that meet your unique, demanding investment criteria. ***Stock Reports:*** You can get stock reports, just as fast. ***Portfolio Management:*** You can enter your own stock ownership information to create a powerful computer-driven portfolio. You can even track hypothetical investment portfolios to evaluate stock selection criteria. ***Report Generator:*** You can get formatted or customized reports up to 230 columns wide. ***Spreadsheet Files:*** You can load any of this data into spreadsheets.



Microsoft Excel and Jazz are among the popular spreadsheets to which VALUE/SCREEN *Plus* can be linked.

Excel is a trademark of Microsoft, Inc. Jazz is a trademark of Lotus Development Corp. VALUE/SCREEN *Plus* is a registered trademark of Value Line, Inc.

$39 Trial

If you act right now we'll send you the complete software package--which regularly sells for $95--for only $39. And we'll include 2 monthly data disks worth $29 each, *absolutely* free. There are not timesharing charges, since up-to-date data is mailed to you regularly on disk. (This special offer is available only once every two years per household.)

800-654-0508

- ☐ I have an IBM compatible, 256K, and want to take the $39 two-month trial.
- ☐ I have an Apple Macintosh, at least 512K, and want to take the $39 two-month trial.
- ☐ My check for $39 is enclosed (NY residents, add sales tax)
- ☐ Please bill my (circle one) Visa MasterCard American Express

Account # _____ Exp. Date _____

Signature _____

Name _____

Address _____

City, State, Zip _____

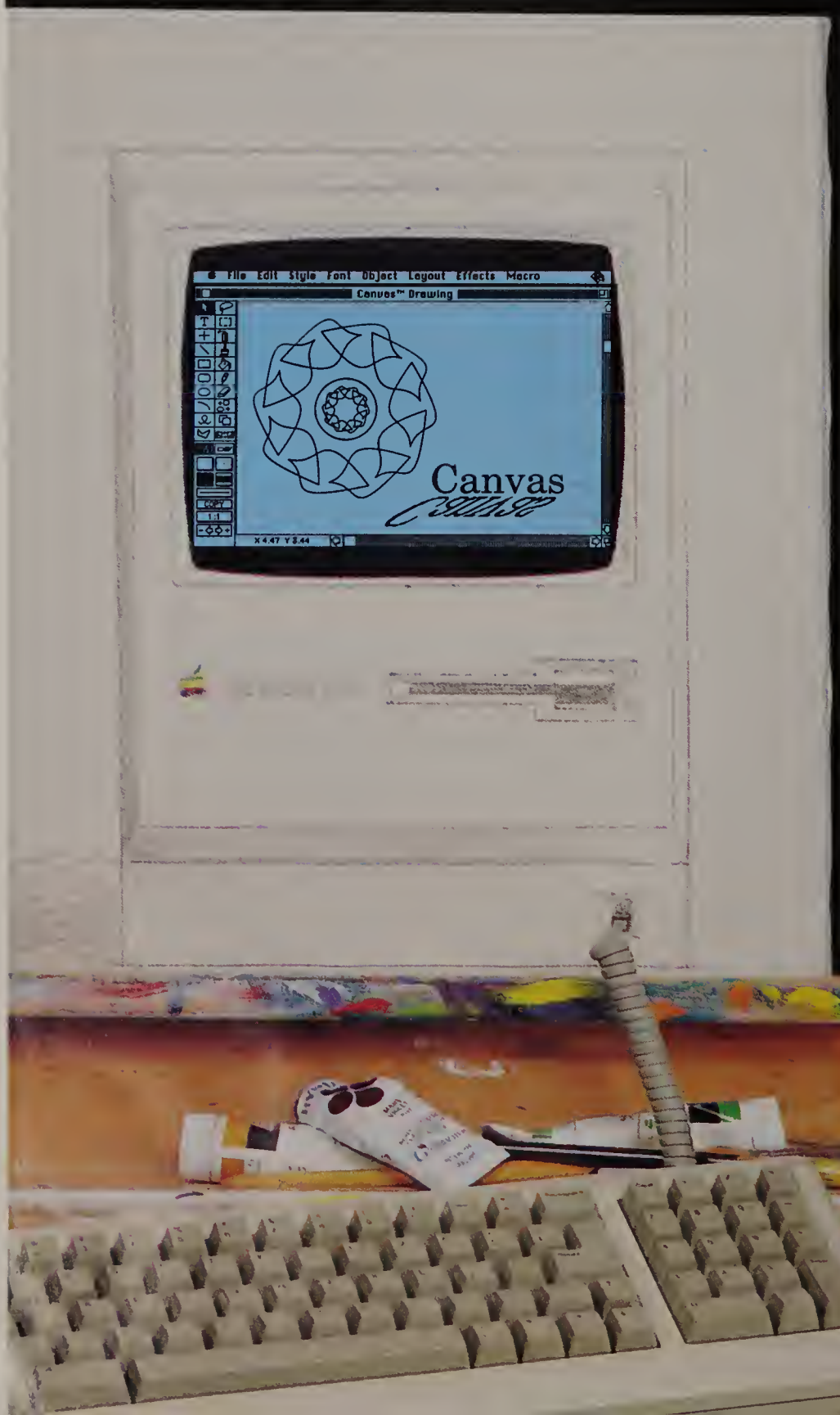
Purchase is nonrefundable, and nonassignable.

Value Line Software
711 Third Avenue,
NY,NY 10017
Dept.65RJ01

Circle 591 on reader service card



CANVAS™



Introducing Canvas.™ The only graphics program that integrates MacDraw™ type objects, high resolution 300 to 2540 dpi images, PostScript™ and MacPaint™ type graphics in a single document.

No more switching from one window to another. No more cutting and pasting between different programs. Everything you want in one program, in one document.

Use Canvas™ for corporate slide presentations, forms, complex graphics, diagrams, newsletters. Any where you want stunning results.

Import graphics from other programs like 4th Dimension,™ Excel™ and More™ to customize charts and graphs.

We've even included a desk accessory version so you can use Canvas™ from within your word processor, spreadsheet, database or desktop publishing program.

Canvas™ allows you to view and edit in any magnification or reduction from 3.125% to 3,200% for incredibly precise control of your image.

Canvas™ is packed with features and powerful special effects. Bezier curves. "What you see is what you get" (WYSIWYG) text editing. 9 feet by 9 feet of *continuous* drawing area. MacrObjects™ (graphic macros). TIFF support. And much more.

So if you're looking for the best of everything, look into Canvas.™

Visit your local dealer for a complete demonstration of Canvas™ and other Deneba software including: Coach,™ the best selling interactive spelling checker desk accessory, Comment,™ the original Macintosh equivalent of 3M's Post-It™ notes and the Coach™ Merriam Webster Thesaurus.

Or call us at 1-800-6CANVAS. In Florida call (305) 594-6965.

Canvas™ $195.00.

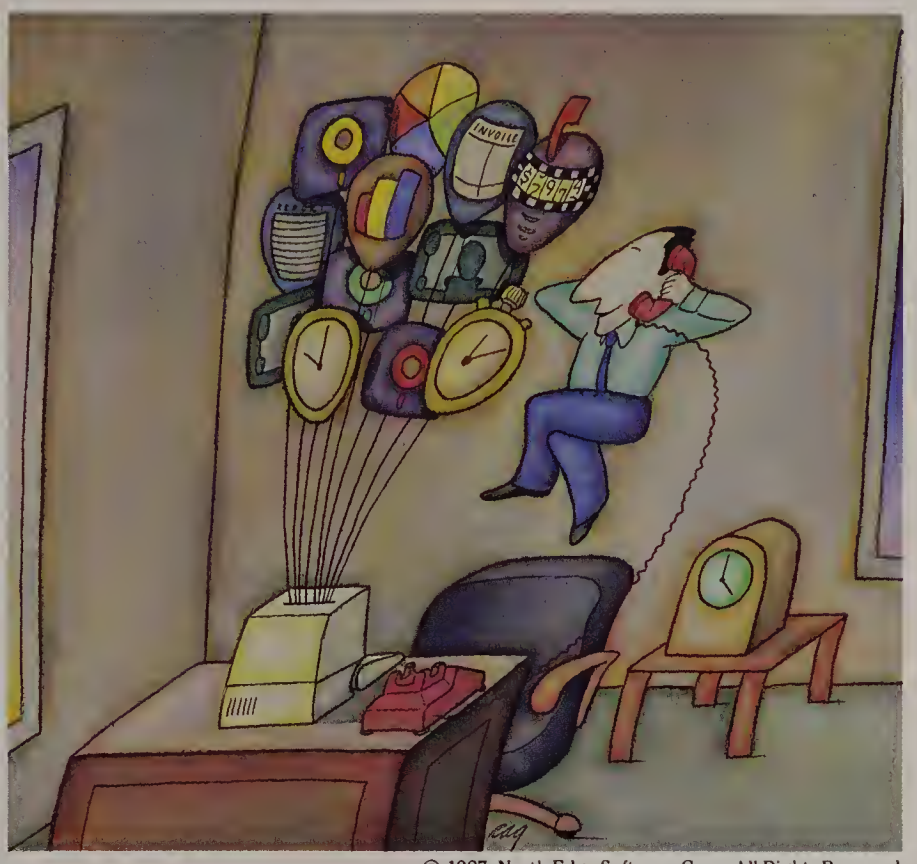
Deneba
SOFTWARE

7855 N.W. 12th Street, Suite 202
Miami, FL 33126

MacDraw, MacPaint and Macintosh are trademarks of Apple Computer Inc. 4th Dimension is a trademark of Acius, Inc. Excel is a trademark of Microsoft Corp. More is a trademark of Living Videotext, Inc. SuperPaint is a trademark of Silicon Beach Software, Inc. GraphicWorks is a trademark of Mindscape, Inc. FullPaint is a trademark of Ann Arbor Softworks, Inc.

Circle 621 on reader service card

TRACK PROJECTS. CAPTURE CASH. NO SWEAT.



© 1987. North Edge Software Corp. All Rights Reserved.

If you bill for your services by the hour, you need TIMESLIPS® III

Without a good time and billing system, your business isn't collecting all the money it's earned. You have to manage the billing process by tracking your expenses and accounts receivables. You need to know who is being billed and why.

Automatically Tracks Time And Expenses. TIMESLIPS® III gives you faster, more accurate billing, recovering cash that could have fallen through the cracks.

It's A Desk Accessory. TIMESLIPS III runs concurrently with other programs, and can be called up whenever you need it.

A built-in "stopwatch" times any phone call or activity as you work. Then automatically calculates the total fee and updates your client file. Instantly.

A unique "dollar clock" can appear in the corner of your screen to keep a running tab of time and billable dollars.

Understands Your Needs. Unlike other billing systems, TIMESLIPS III allows for *real-time* entry of expenses information while within another program.

Like time and billing systems costing lots more, it provides expanded description on each timeslip. It exports data to virtually any program that accepts tab-delimited files, such as Excel,™ Jazz,™ and Microsoft Works.™

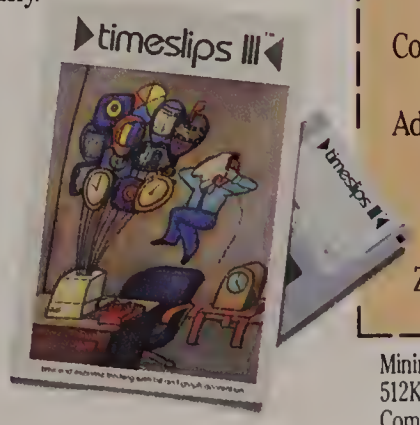
Generates Custom Bills And Reports. With over 5,000 ways to create a bill, you can satisfy any client demand, or meet any office need.

TIMESLIPS III generates transaction reports, client history, aged receivables, and management reports.

Tables, bar graphs, pie-charts, easy-on-the-eye formats leap to the screen, giving you masterful control and analysis capabilities. Information, intelligently organized so you don't have to be.

TIMESLIPS III Is A Productivity Tool. It gives you a clear picture of your business: an activity-by-activity breakdown for each project. What was accomplished. How long it took. And the actual fee.

You Probably Can't Outgrow TIMESLIPS III. It lets 250 of your colleagues handle 2,000 clients, with up to 128 projects per client. And track all simultaneously.



30-Day Money-Back Guarantee.
If you're not happy, we'll return your money.* In the meantime, you'll find our level of technical support virtually unparalleled.

Send for TIMESLIPS III. It's one of the most powerful, yet easy to use time and billing systems ever offered. Compare it to any other, at any price.

CALL TOLL-FREE 1-800-338-5314

In Mass. and for rush service or technical information, call 617-768-6100.

☐ Please rush me _____ copies of TIMESLIPS III at **$199.95** plus $7.00 s/h.
For a total of $_____
(Mass. residents add 5% sales tax.)
☐ Enclosed is my check.
☐ Please charge my Visa ____ M/C ____
Card No. _____
Exp. _____
Name _____
Company _____
Address _____
City _____ State _____
Zip _____ Tel. (____) _____
MAC 188

Minimum Requirements: Macintosh Computer with at least 512K and either 2 floppy disks or 1 floppy and 1 hard drive. Compatible with MAC II.

*If purchased directly from North Edge Software Corp.

NORTH EDGE SOFTWARE CORP.
239 Western Avenue, Essex, MA 01929

TIMESLIPS III is a registered trademark of North Edge Software Corp. Excel is a trademark of Microsoft. Jazz is a trademark of Lotus Development Corp. Microsoft Works is a trademark of Microsoft.

Circle 559 on reader service card



Performance Without Compromise.

Mac II power for the SE:

Once you try an accelerated SE, you won't want to go back. Prodigy SE™ by Levco gives you the highest performance, true Mac™ II and SE compatibility, and *confidence* that your system will expand properly. Here's how:

High performance design—no compromise.

The Prodigy SE gives you the 32-bit 68020 running at 16MHz, with fast, 32-bit memory. Like the Mac II. Not the slower, 16-bit memory on the SE motherboard that some accelerators use.

The 68881 coprocessor chip that speeds math operations up to 100 times now comes *standard*.

Your SE will run Mac II software faster than a Mac II. Unlike some other accelerators, Prodigy SE lets you switch back to *native* SE mode.

The Prodigy SE can expand to 32 Mb of RAM. (Some accelerators limit you to 4 Mb.) And, like the Mac II, Prodigy SE includes a socket for the PMMU chip that is essential for Apple's® upcoming A/UX™. Boards without the PMMU lock you out of Apple's next-generation software.

Keep your SE expansion options—no compromise.

The Prodigy SE's optional SE expansion slot lets you connect *your choice* of SE expansion peripherals. Like our SuperView large screen monitor.

Some accelerators don't give you a true SE expansion slot, limiting your options.

Superb support—no compromise.

Our thorough documentation—rated highest by InfoWorld—will answer your questions. Our high performance support hotline will solve your problems. Period.

For your nearest *authorized* SuperMac™ dealer, call today.

Find out why Byte Magazine, when comparing SE accelerators, concluded, "The Prodigy SE wins on both performance and peripheral expandability." Or why InfoWorld has given Prodigy SE the highest rating of all accelerators reviewed.

SuperMac Technology
295 N. Bernardo
Mountain View, CA 94043

SUPERMAC TECHNOLOGY

(415) 964-8884 Dept 13

Apple is a registered trademark, Macintosh II, SE, and A/UX are trademarks of Apple Computer Inc. Prodigy SE is a trademark of Levco Inc., a division of Scientific Micro Systems. SuperMac is a trademark of SuperMac Technology, a division of Scientific Micro Systems.

new Apple would preserve all the neat tricks and user-pleasing ideas of *Servant* in its own finished product. The strength of *Servant* was in its more powerful interface–new ways to show icons, move them around, and arrange them on screen–but Apple wanted to emphasize multitasking in its eventual product. Hertzfeld couldn't sleep at night, torn between preserving the artistic integrity of the product and doing "what would be best for Mac."

He thought he could do a better job of writing the program himself, insulated from the Apple bureacracy. But he knew that no matter how good his program was, it didn't have a chance at effective multitasking unless Apple itself marketed the program as basic system software. Only then, with the mother company supporting the product, would there be incentive for those who write applications software to conform to the inevitable restrictions of this new Finder so that the applications would "behave" together.

Finally Hertzfeld arrived at a solution. He approached Apple and offered them the program for *half* the $200,000–if they would take nonexclusive rights. That way, he would work on his product, and they would work on theirs. Apple accepted, and MultiFinder was underway.

Andy, meanwhile, continued to work on *Servant,* which he intended to distribute free to anyone who cared to have it. The dream would be preserved.

Every Twitch Way

That's Andy's half of the story. Now for Apple's.

By 1986 it was clear to everyone at Apple that the Mac needed a new Finder that could handle more than one program at once. That capability was expected on the new Mac II, and it would be a boon to Apple if the program would work on older Macs as well. Why Apple was not hard at work on this *before* 1986 is a mystery, and maybe a scandal, but in any case it became a priority. The person charged with creating this software was Erich Ringewald, then 26, an Apple engineer since March 1985. It was Ringewald who had been assigned responsibility for *Switcher* support in the latter versions of that program, though his relationship with Andy Hertzfeld had never been warm. Ringewald respected Hertzfeld's talents, but thought he could do the new Finder, code-named Twitcher (clever, huh?), very well, thank you, without Andy's help.

(continues)



The precision of a DRAW program

The fine detail of a PAINT program

Now combined in

SuperPaint

Graphics for the Macintosh will never be the same again. Before it was paint or draw. One or the other. Now, nothing less than both will do. With SuperPaint, you can edit dot by dot in the PAINT layer and you can create and manipulate objects in the DRAW layer.

Until recently, paint programs only printed at 72 dpi. Now SuperPaint's unique LaserBits™ feature allows you to magnify and work on dots in the paint layer at an amazing 300 dpi resolution! These high resolution images can be pasted directly into your word processor or page layout program.

SuperPaint. When all you need is a masterpiece!



(compared to other paint programs) "SuperPaint is the clear winner and... MacPaint's heir apparent."
Adrian Mello, MacWorld, Jan '87

"SuperPaint is the hottest graphics package currently available."
Bob LeVitus, MACazine, Jan '87

"Is SuperPaint really super? Absolutely."
Sharon Aker, MacUser, Feb '87

Suggested Retail Price: $149.95

System Requirements:
Macintosh 512K, Plus, XL (1 mb)

*Macintosh is a trademark licensed to Apple Computer, Inc.
LaserBits is a trademark of Silicon Beach Software, Inc.

SILICON BEACH SOFTWARE™

Silicon Beach Software, Inc.
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956

Circle 266 on reader service card



Get the lion's share online with GEnie.™

"GEnie changed my mind about what an online service can do for me! I always knew that GEnie offered a princely selection of Special Interest Groups featuring thousands of software files, dynamic bulletin boards, lively discussions and "tips" from the experts. But now GEnie gives me more than my share of valuable information services like NewsGrid and USA Today Decisionlines, American Airlines EAASY SABRE℠ personal reservation system, new and exciting multi-player games and access to Dow Jones News/Retrieval® And the people on GEnie are so friendly and helpful they make me feel like a member of royalty!

You don't need to pay a king's ransom to get the lion's share, because only GEnie offers you so much online, for less."

B. A. King

Services Available	Compare & Save	Pricing*			
		Registration Fee	Monthly Minimum	Non-prime Time Rates	
				300 baud	1200 baud
Electronic Mail • CB • SIGs/User Groups • Travel • Shopping • Finance • Reference Professional • Leisure • Games • News	**GEnie†**	**$29.95***	**None**	**$5.00**	**$5.00**
	CompuServe	$39.95	None	$6.00	$12.50
	Other	$49.95	$10.00	$8.40	$10.80

**$18 Registration fee extended to 12/31/87.*

Just $5 per hour. Get online today!

1. Have your major credit card or checking account number ready.
2. Set your modem for local echo (half duplex)—300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH
4. At the U#= prompt enter **XJM11827,GEnie** then RETURN.

Need help or more information? No modem yet? We can help.
In U.S. or Canada call **1-800-638-9636.**

We bring good things to life.

*Basic rates and services in effect 9/87 apply in U.S. only. †Non-prime time rates apply Mon.-Fri. 6 PM-8 AM local time and all day Sat., Sun., and natl. holidays. Subject to service availability. Some services offered on GEnie may include additional charges. Dow Jones News/Retrieval is a registered service mark of Dow Jones & Company, Inc.

© 1987 General Electric Company, U.S.A.

According to Ringewald, Apple's purchase of *Servant* was irrelevant to those working on Twitcher. "We had the same goal, but Andy was beginning from the old Finder and interested in user extensions to it," he says. "I was interested in a stable mechanism [to run more than one program at once]." A big difference between the two programs is how they handle windows when two or more programs run at once. (Just how they differ is too technical get into here, and I suspect it's one of those religious battles that programmers have.) As far as Ringewald was concerned, Apple's purchase was unnecessary, and he insists that he was never even curious to see *Servant*.

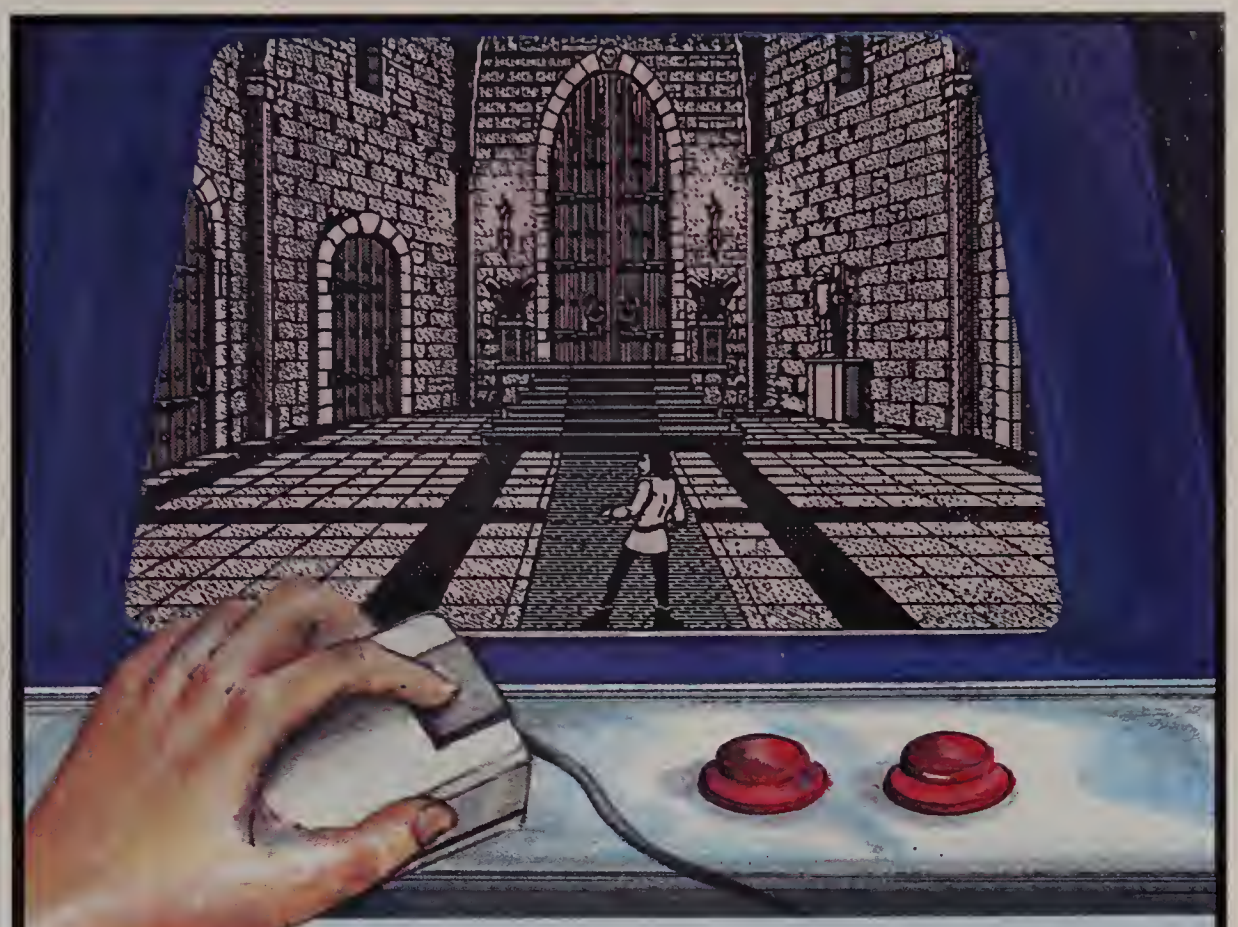
Ringewald was later joined by a new Apple programmer, Phil Goldman, and by the end of 1986 Apple was ready to send a prerelease Twitcher to selected developers, under the name of Juggler. The biggest problem, as expected, was accommodating applications that "misbehaved" in certain ways: some programs try to hog the whole machine. Ringewald thinks he did a pretty good job in dealing with those malefactors, or at least setting up rules for their rehabilitation in future versions. By the time of the Expo, when the program was announced, MultiFinder (alas, the nifty Juggler name was already taken) was able to run an impressive demo without crashing. Judging from the educated oohs and ahhs from that demo, Apple did the right thing with MultiFinder. By concentrating on the juggling power rather than *Servant*-like user-interface features, it gave its customers what they needed immediately.

How soon they would have done this without Andy Hertzfeld's original contribution is a matter of opinion. My opinion: not soon enough.

Memory Lane

So where are we now? Well, MultiFinder is a big step for Apple, which sees it mainly as that–a step. Charles Oppenheimer, Apple's mouthpiece for MultiFinder, explains that system software is "not a point in time, it's a continuum." At this point in the continuum, we have a Finder heir that can kind of do multitasking. That near-hit does not satisfy everybody. In these grown-up days of Macintosh, there is no shortage of techno-weenies and MIS guys who huff and puff and say, "Can this do *true* multitasking?" And to those, Charlie Oppenheimer says, "Not exactly." But he says MultiFinder will increase the

(continues)



ARCADE QUALITY
on your Mac

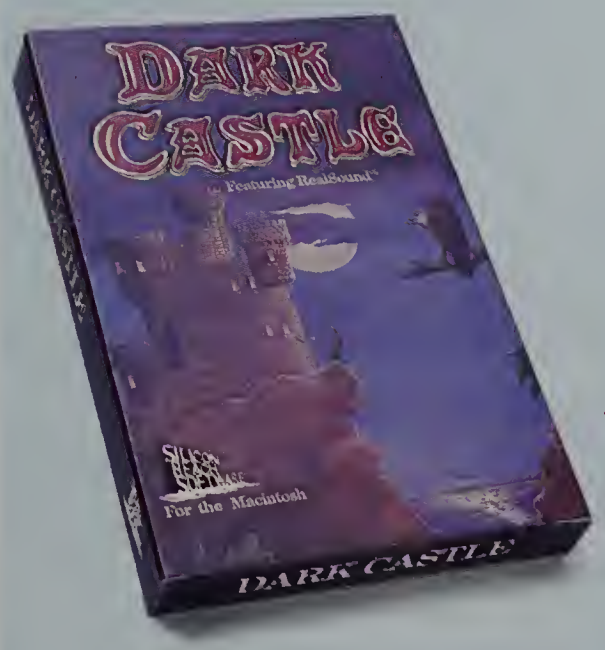
Enter the Dark Castle at your own risk. Watch out for trap doors, boulders and lightning bolts! Fight off rats and bats, knife-throwing guards, mutants, vultures, flying griffins, magic brooms, the relentless floating eye, dragons and the sadistic torturer! And throughout it all you'll hear the famous Silicon Beach RealSound™.

"The first game that I have seen on any computer that will rival an arcade game."
Robert Forras, MacTimes, Nov-Dec '86

"Silicon Beach has produced another startling advance in computer games. The game is spectacular."
Linda Kaplan, MacUser, Feb '87

"This is the coolest Macintosh game I've ever seen."
Bob LeVitus, MACazine, Dec '86

"Dark Castle provides the highest quality graphics and sound of any Macintosh game available."
Ken Goehner, MacWorld, Mar '87



Suggested Retail Price: $49.95

System Requirements:
Macintosh 512K, Plus

*Macintosh is a trademark licensed to Apple Computer, Inc.
RealSound is a trademark of Silicon Beach Software, Inc.

SILICON BEACH SOFTWARE™

Silicon Beach Software, Inc.
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956

Circle 266 on reader service card

POWER2 EXPAND!



Quality Memory for Under

$158!

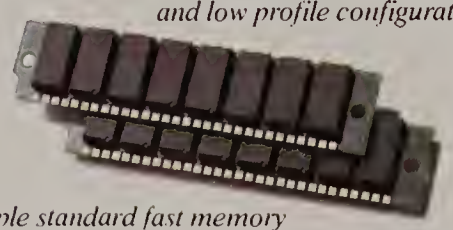
That's right! For only $157.50 per Mb, **MASS♦PLUS** gives your Mac fast 2Mb CMOS memory. Guaranteed compatibility with ALL software and future memory upgrades!

MASS♦PAK uses 1 Mb surface-mounted CMOS SIMMs to expand your MacPlus, SE, and II. Adding 2Mb at a time, you can take your system up to it's full potential!

Experience the full power of HyperCard, AUX, and MultiFinder. RAM Disks give your Mac lightning speed! PageMaker, Illustrator, and others take on a new dimension!

Service and Support are **MASS♦MICRO Systems'** foundation. Every product comes with easy to follow instructions, and our 24 hr/day, 7 day/wk Support Hotline!

Low power/heat CMOS chips and low profile configuration



Apple standard fast memory

Order Today - experience the thrill of a performance Mac! Includes installation tools, 30 day money back guarantee, and lifetime warranty. **Buy direct and save!**

	1 to 4	5 or more
MASS♦PLUS™ For MacPlus only	$349	**$315**
MASS♦PAK™ 2Mb upgrades for MacPlus, SE and II	$475	**$429**

Corporate Accounts Welcome

MASS♦MICRO systems

(800) 253-8900

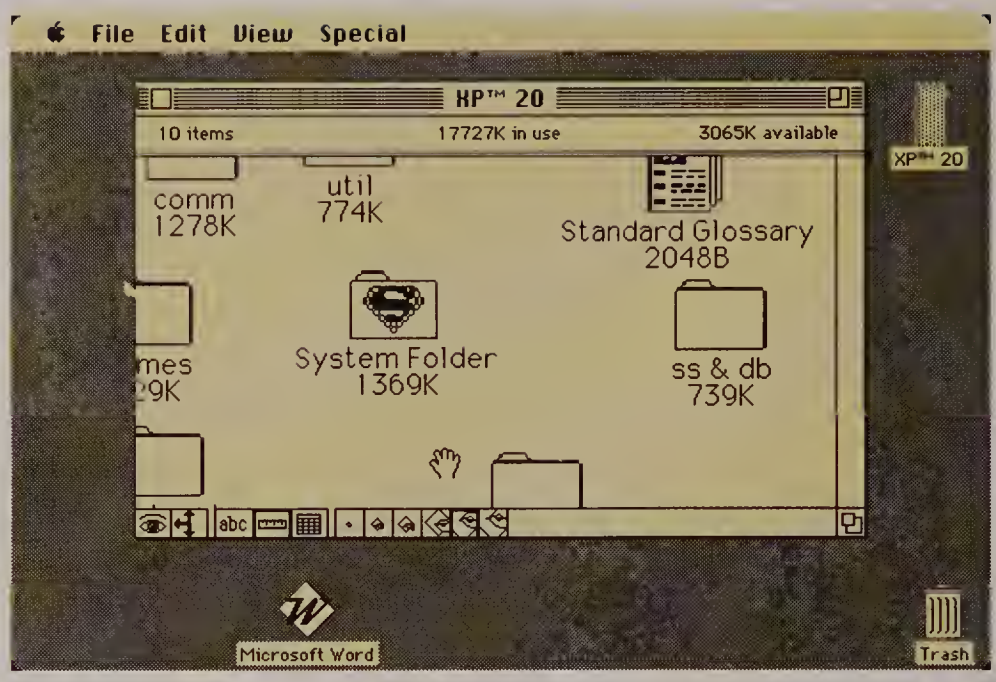
(408) 988-1200 in California
3250 Jay Street♦Santa Clara♦CA♦95054

Certified Apple Developer

MASS♦PLUS and MASS♦PAK are registered trademarks of MASS♦MICRO Systems, Inc
Add 4% to above prices for credit card purchases

Circle 764 on reader service card

Steven Levy



Servant *uses the hand to move around, instead of scroll bars. The tools at the bottom of the window let you navigate in the window and customize the user interface. Here, a magnified view is selected and the file-size icon (ruler symbol) is selected, causing the file's K count to appear under each file or folder name.*

utility of the Macintosh because it is now absurdly easy to have several applications open at the same time. This is especially helpful for those running *HyperCard,* a program that works best if it is "on" all the time. And what multitasking MultiFinder does do–background printing for laser printers and communications while other programs run–is the kind of thing most people will use. Best of all, MultiFinder does this on Mac Pluses and SEs as well as the Mac II, something we veterans will appreciate.

Later on will come a version in which programs not only run at the same time, but also run *with* each other. How much later on is anyone's guess.

It's a brave new world, but there is an entry fee. MultiFinder takes up a lot of memory on its own–so much that with "only" a megabyte of memory, the hopper fills up after only one decent-size application, negating the purpose of the program. And *HyperCard,* presumably the program that will take most advantage of MultiFinder, won't run *at all* with MultiFinder in a 1MB machine. Since at this writing no Apple computer comes standard with more than 1MB of memory, we are now in a situation analogous to the days of the 128K Mac, the last time Apple shipped a computer with insufficient power to run its standard software. Now 2MB is the obvious minimum, probably 3MB if you want *HyperCard* on all the time.

People will eventually get the extra memory, and the New Apple will find MultiFinder a valuable weapon in its battle for real-world acceptance for the Macintosh. The present MultiFinder is a big win, and its future looks even more promising.

For Andy Hertzfeld, though, the experience has been mixed. He's spent months working on his version of the Finder, *Servant,* perhaps imprudently. "I couldn't help it," he says, "I wasn't working on it, it was working on me." *Servant* is now available on CompuServe and other bulletin boards, and from user groups. You should check it out, see the way it handles icons, and marvel at its file-copying tricks. Have fun with it. Andy hopes that its innovations will find their way into Apple's system software: "In a way, I'm forcing Apple to improve things. If I come up with a better way of doing something and people see it, Apple will copy it." Or so he hopes.

Meanwhile, MultiFinder is here, relegating *Servant* to the status of a curiosity. MultiFinder is not so much fun as it is productive. Just like the New Apple. The Macintosh, as evidenced by the gold-diggers at the Expo, has finally made it. Nodding toward the masses of well-heeled professionals making the rounds of over 200 exhibitors at the show, Andy Hertzfeld admitted that it was the end of an era. "The Mac roller coaster has come to a halt," he said, indicating that the days of ups and downs have been replaced by stable acceptance. "It's time for me to get off and find a new one."

For Apple it's time to consolidate and improve, and to make further inroads into the serious world of computing. The MultiFinder and its descendants will do that. But I hope the company won't forget the early creativity that gave Mac its technological head start–nor the people who, with the foolishness of lovers, gave years of their lives, as well as their hearts, to a computer and a dream. Apple will survive without Andy Hertzfeld and indeed without Steve Jobs. But there is no need for Apple to purge its zealous past in order to preserve its productive future. □

How to expand 20Mb of external storage to 120Mb



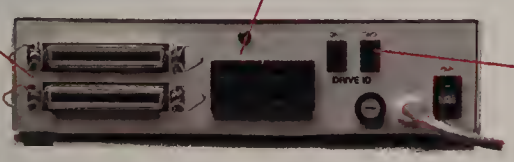


Only MASS◆MICRO Systems offers you the *POWER2 EXPAND!* for $445

MASS◆MICRO Systems drives are designed with YOU and your Mac in mind! Our exclusive design allows you to start with 20Mb to 100Mb and expand your system up to 200Mb anytime you need the ***POWER2 EXPAND!***

No Expensive SCSI terminator required!

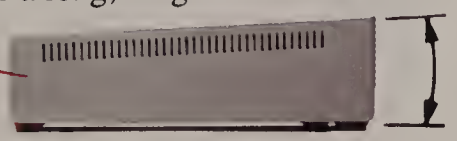
2 surge-protected switched outlets means one switch turns on your entire system



Precision push-button SCSI ID switches. No tools needed!

Lightning fast average access of less than 35ms, low power consumption, and a unique locking system to automatically store the heads on power down, give our drives real value. More than reliable, with a 25,000 hr MTBF (one of the highest in the industry) you can depend on them for a long, long time!

Ergonomic design gives you the optimum viewing angle



Compatible with all Mac Plus, SE, & II's		1 to 4	5 or more
MASS◆20*e*	23Mb	$649	$585
MASS◆30*e*	32Mb	$849	$785
MASS◆40*e*	43Mb	$949	$855
MASS◆50*e*	50Mb	$1049	$955
MASS◆65*e*	65Mb	$1149	$1035
MASS◆100*e*	102Mb	$1649	$1485

MASS◆STORAGE Family Power2 Expand! and P2E Drives are all registered trademarks of MASS◆MICRO Systems, Inc.

Order Today - get the *POWER2 EXPAND* into your future! Includes our 24 hr/day, 7 day/wk Support Hotline, 30 day money back guarantee, and a 1 year warranty. **Buy direct and save!**



MASS◆MICRO systems

(800) 253-8900 (408) 988-1200 in CA

3250 Jay Street ◆ Santa Clara ◆ CA ◆ 95054

MasterCard **Certified Apple Developer** VISA

POWER2 EXPAND! Drives		
P2E◆20	23Mb	$489
P2E◆30	32Mb	$549
P2E◆40	43Mb	$649
P2E◆50	50Mb	$749
P2E◆65	65Mb	$849
P2E◆100	102Mb	$1449

Add 4% to above prices for credit card purchases.

Circle 206 on reader service card

Corporate Accounts Welcome

Programs & Peripherals

Picks of the Month



Rags to Riches 3 Pak GL/AR/AP Version III by Chang Laboratories



Rags to Riches Version III provides users more "Choices" in their accounting selection, setup, operation and reporting! Each module has more options to let you customize the operation to the way YOU do business. It gives you more flexibility to format reports, invoices and statements to suit your personality. This is the fastest accounting package available for the Macintosh. Success in accounting can be yours with *Rags to Riches Version III.*

Rags to Riches 3 Pack *(GL/AR/AP)* Version III ..... **279.**

Word Finder by Microlytics, Inc.



Word Finder is an electronic thesaurus in desk accessory format. Once you select *Word Finder* from the Apple menu, it appears in the menu bar of the program you're using. Just select the word you want an alternate for, and up pops a window of synonyms. Simply choose a synonym, double click on it, and the new word replaces the old word! Add that extra "pizzaz" to your writing with *Word Finder.*

Word Finder ..... **39.**

Cricket Graph by Cricket Software



Cricket Graph is a complete professional system with all the options you need for easy graph construction. Choose from 12 of the most popular graphs and charts and plot 2000 data points per series. You can import data in many popular formats and then enhance your graphs with text, patterns and symbols. And, *Cricket Graph* gives you the ability to transform your data into brilliant color presentations. Get *Cricket Graph* and you'll wonder how you ever created graphs before!

Cricket Graph ..... **119.**

Utility Software

ALSoft			
Disk Express			26.
Berkeley System Design			
Stepping Out *(Macintosh Screen Extender)*			55.
CE Software			
QuicKeys *(Macro Program)*			69.
DiskTop 3.0 *(Portable DA Finder)*			32.
CalendarMaker 3.0 *(Custom Calendars)*			32.
Central Point Software			
Copy II Mac *(Includes MacTools)*			21.
Centram Systems West, Inc.			
Tops For The Macintosh			119.
Fifth Generation Systems			
FastBack For The Macintosh			59.
Ideaform			
Mac Labeler or DiskQuick			28.
Infosphere			
MacServe *(Network Software)*			164.
LaserServe *(LaserWriter Print Spooler)*			64.
ComServe *(Modem Sharing Software)*			124.
Olduvai Software			
DA-Switcher *(Switch Multiple Sets of DA's)*		***Special***	25.
Icon-It! *(Assign Icons to Menu Items)*		***Special***	40.
Read It! TS *(For Thunderscan)*			89.
Read It! *(For Image Scanners)*			179.
Personal Computer Peripherals Corp.			
HFS Backup V2.0			29.
Software Supply			
Suitcase or Power Station			38.
SuperMac Software			
SuperSpool *(ImageWriter Print Spooler Utility)*		***Special***	42.
SuperLaserSpool		***Special***	82.
Multi-User SuperLaserSpool		***Special***	199.
Diskfit *(Backup & Restore Utility)*		***Special***	42.
Sentinel		***Special***	82.
THINK Technologies			
HFS Navigator			35.
LaserSpeed *(Single User)*			55.
Williams & Macias myDiskLabeler			24.
myDiskLabeler w/Color			33.
myDiskLabeler w/LaserWriter Option			35.
Working Software, Inc.			
Findswell *(Document Finder)*			32.

Desk Accessory Programs

Affinity Microsystems Tempo			54.
Batteries Included			
Battery Pak *(9 Desk Accessories)*			31.
Borland SideKick V2.0			59.
Cortland			
Top Desk *(7 New Desk Accessories)*			33.
Greene, Inc. QuickDex *(Computerized Address Book)*			24.
Imagine Software			
Smart Alarms & Appointment Diary			35.
Multi-User Appointment Diary with Smart Alarms			95.
Solutions, International			
SmartScrap & The Clipper *(New Scrapbook DA)*		***Special***	38.

Languages

Apple Computer			
MacPascal			99.
Borland			
Turbo Pascal			59.
Turbo Pascal Database Toolbox			59.
Turbo Pascal Numerical Methods			59.
Turbo Pascal Tutor			49.
Consulair			
Macintosh 68000 Development System			59.
Mainstay			
V.I.P. *(Visual Interactive Programming)*			85.
Microsoft			
Microsoft Basic Interpreter 3.0			62.
Microsoft Basic Compiler 1.0			119.
Microsoft Fortran Compiler 2.2			169.
THINK Technologies			
Lightspeed C			95.
Lightspeed Pascal			65.
TML Systems			
TML Pascal V2.0			68.
Zedcor, Inc.			
ZBasic 4.0			69.

Communications Software

Apple Computer MacTerminal			99.
Compuserve			
Compuserve Starter Kit			24.
DataViz MacLink Plus with Cable			149.
Software Ventures			
Microphone 1.1 *(Includes Glue)*			119.
Think Technologies, Inc.			
InBox-Starter Kit V2.0 *(3 Personal Connections)*			199.
InBox-Mac Connection			79.
InBox-PC Connection *(Req. AppleTalk Card)*			109.

to Polish Up Your Mac...

with Special Pricing!

Specials good through January 31, 1988

SuperSpool, SuperLaserSpool, DiskFit & Sentinel by SuperMac Software



Sooner or later you'll find that you have to spool-up, back-up or lock-up your data and it's a safe bet that *SuperMac* has just the programs you'll be looking for. ***SuperSpool*** and ***SuperLaserSpool*** return control of your Mac to YOU while your printer is busy printing. ***DiskFit*** is a utility that let's you quickly backup your hard disk to floppies keeping your data protected from electronic tribulations. And, ***Sentinel*** allows you to lock up your private documents by encrypting the data, keeping it safe from prying eyes!

SuperSpool ..... **42.**
SuperLaserSpool ..... **82.**
Multi-User SuperLaserSpool ..... **199.**
DiskFit ..... **42.**
Sentinel ..... **82.**

MacBottom SCSI Hard Disk Drives by PCPC



MacBottom SCSI Drives arrive completely formatted with easy-to-use software including a print spooler, a floppy disk duplicator and a backup program. *MacBottoms* come with everything you need to get started including cables, terminators, and an additional SCSI port. You can even get a Hayes compatible 1200 baud modem built right in. *MacBottoms* weigh less than five pounds and measure just two inches tall but no other hard disk stacks up!

Available in either platinum or beige color. Please specify.

MacBottom 21 MB Hard Drive ..... **759.**
MacBottom 32 MB Hard Drive ..... **889.**
MacBottom 45 MB Hard Drive ..... **1149.**
Optional Built-in 1200 Baud Modem models ..... **Call**

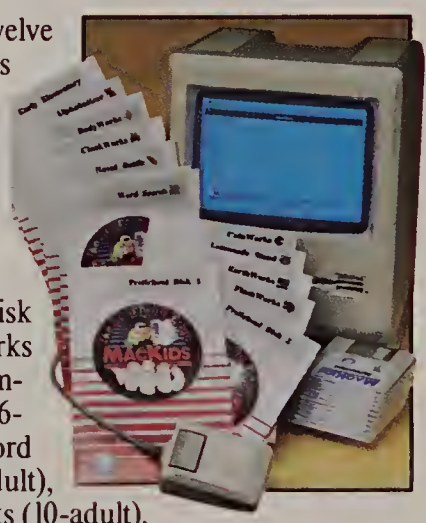
Icon-It!, DA-Switcher, and Post-Art by Olduvai Software



With ***Icon-It!*** you can add life to all your applications by assigning familiar pictures to represent menu items or desk accessories. A simple click will do the job — and you can even launch Excel or Tempo macros with icon selections. ***DA-Switcher*** is designed to allow you to use an unlimited amount of desk accessories by letting you "switch" the accessories in the Apple menu. And, ***Post-ART*** is a 3-disk set of full-size illustrations by the award-winning artist J. Ciccone which includes software that allows you to print every *Post-ART* file without the need of a drawing program!

Icon-It! ..... **40.**
DA-Switcher ..... **25.**
Post-ART ..... **35.**

MacKids Educational Programs by Nordic Software



MacKids is a complete series of twelve quality educational software products for the Mac specifically designed to teach and entertain kids. Whether your children are preschoolers or young adults, there's a *MacKids* package that will give them the learning edge.

Preschool Disk 1 (3-7), Preschool Disk 2 (3-7), CoinWorks (4-12), ClockWorks (4-10), Early Elementary 1 (6-9), Lemonade Stand (6-16), FlashWorks (6-adult), Naval Battle (6-adult), Word Search (6-adult), Alphabetizer (7-adult), EarthWorks (10-adult), or Bodyworks (10-adult).

Each Program ..... **29.**

SmartScrap & The Clipper by Solutions International



SmartScrap & The Clipper includes two desk accessories that enhance the way you deal with your clip art. *SmartScrap* is an improved scrapbook DA that allows you to see all your clip art by scrolling and lets you keep multiple scrapbooks on any disk. And, *The Clipper* is a great cropping and scaling tool that determines the dimensions of an area where a picture is to be pasted, reducing or enlarging it to the exact dimensions needed.

SmartScrap & The Clipper ..... **38.**

Positively A Plus

PROGRAMS PLUS

800/832-3201

Circle 194 on reader service card

& Phenomenal Prices . .

DataBase Management

Acius 4th Dimension	559.
Apple Computer HyperCard	42.
Ashton Tate dBase Mac 1.0	295.
Blythe Software	
Omnis 3 Plus/*Express*	279.
Omnis 3 Plus Multi-User *(MacServe, Tops Network, Corvus, or Appleshare Network)*	489.
Borland Reflex Plus	165.
Chang Laboratories	
C.A.T. Contacts•Activities•Time	229.
Microsoft Microsoft File 1.05	110.
Nantucket Software McMax	189.
Nashoba Systems FileMaker Plus	149.
Odesta Double Helix II	339.
Multi-User Helix	429.
ProVUE Development OverVUE 2.1	149.
Software Discoveries RecordHolderPlus	45.

Business Software

Activision Focal Point	64.
Apple Computer MacProject	159.
Bravo Technologies MacCalc	85.
Borland Eureka! The Solver	129.
Cricket Software Cricket Presents...	289.
Cricket Graph *Special*	119.
Data Tailor	
Trapeze 2.0 *(Spreadsheet/Color Report Generator)*	239.
Deneba Software Comment *(Attach Electronic Notes to Files)*	64.
Layered	
Notes For Excel, Jazz, PageMaker, Microsoft Works or Word 3.0 *(each)*	41.
Legisoft/Nolo Press WillWriter V2.0	30.
Lotus Jazz 1A	179.
Lundeen & Associates	
WorksPlus Commands	65.
MacroPac International	
101 Macros For Excel	45.
Micro Planning Software	
Micro Planner Plus	299.
Microsoft Microsoft Works 1.10	185.
Microsoft Multiplan 1.11	110.
Microsoft Chart 1.02	72.
Microsoft Excel 1.04	224.
Microsoft PowerPoint	Call
Satori Software Legal Billing	369.
Legal Billing II	539.
Project Billing	439.
Bulk Mailer 3.0	82.
Bulk Mailer Plus 3.0	195.

Word & Outline Processors

Ann Arbor Softworks	
FullWrite Professional	169.
Apple Computer MacWrite	99.
Firebird Licensees	
Laser Author	125.
Living Videotext More	149.
Microsoft Microsoft Word 3.01	239.
MindWork Software	
MindWrite 1.1	159.
OWL International	
Guide	77.
Guide Envelope System	99.
Symmetry Acta V2.0	37.
T/Maker Company WriteNow	98.

Spelling & Grammar Checkers

Aegis Development	
Doug Clapp's Word Tools	42.
A.L.P. Systems MacProof 3.0 *(Requires MacPlus)*	125.
Batteries Included	
Thunder! *(Interactive Spelling Checker)*	31.
Deneba Software	
Spelling Coach 3.0 *(Webster's/Medical/Legal/Hyphenation)*	62.
Spelling Coach 3.0 Professional *(Adds Definitions & Thesaurus)*	119.
Coach Merriam Webster's Thesaurus 2.0	39.
Lundeen & Associates	
WorksPlus Spell 1.1	49.
Microlytics, Inc.	
Word Finder *(Synonym Finder)* *Special*	39.
Working Software, Inc.	
Spellswell Spelling Checker & Proofreader 2.0	42.
Spellswell Medical Dictionary *(35,000 Medical Terms)*	57.
Lookup *(Makes Spelling Suggestions)*	29.

Desktop Publishing

Aldus Corporation	
PageMaker	399.
Allan Bonadio Associates	
Expressionist *(Equation Processor)*	52.
Boston Publishing Systems	
The MacPublisher III	119.
Letraset Ready, Set, Go! 4.0	279.
ImageStudio *(Image Processing Software)*	279.
Postcraft International, Inc.	
Laser FX *(Special Effects for Desktop Publishing)*	125.
Quark, Inc. QuarkXPress	479.
Solutions, International	
Glue *(Adds "Print to Disk" Capability)*	38.
Super Glue *(Graphics Integration Software)*	57.
Target Software Scoop	379.

Accounting Packages

Chang Labs	
New Enhanced Version III Modules!	
Rags to Riches GL, AR, or AP	120.
Rags to Riches Three Pack- *(GL/AR/AP)* *Special*	279.
Inventory Control or Professional Billing	239.
Professional Three Pack- GL/Professional Billing/Payables	349.
Digital, Etc.	
Turbo Maccountant V2.0	255.
Migent In House Accountant	99.
Monogram Dollars & $ense 4.0	81.
Peachtree	
Back To Basics Three Pack *(GL/AR/AP)*	139.
Survivor Software MacMoney *(Financial Planner)*	41.

Statistics Packages

BrainPower	
StatView 512 Plus	175.
Cricket Software Statworks	75.
Systat	
Systat 3.1 *(Specify Mac 512K, MacPlus, or Mac II)*	459.

Graphics Software

ABA Software Draw It Again Sam...	99.
Adobe Systems Adobe Illustrator *(MacPlus, SE & Mac II)*	379.
Altsys Corp. FONTastic	27.
FONTastic *Plus*	48.
Fontographer 2.2	239.
Ann Arbor Softworks Full Paint	53.
Apple Computer MacPaint	99.
Broderbund Print Shop	38.
VideoWorks II	119.
Casadyware	
Fluent Fonts 2.0 *(Two-Disk Set)*	28.
Fluent Laser Fonts Vol. 1-15 *(ea)*	46.
Deneba Software Canvas 1.0 *(Includes Desk Accessory)*	125.
Dubl-Click Software	
World Class Fonts! *(Both Volumes)*	46.
WetPaint *(Both Volumes)*	46.
Enzan-Hoshigumi USA	
MacCalligraphy 2.0	115.
Japanese Clip Art Scroll 1 *"Heaven"* or Scroll 2 *"Earth"*	59.
Japanese Clip Art *"Borders"* Scroll	69.
Foundation Publishing	
Comic Strip Factory	48.
Comic People	26.
LaserWare, Inc. LaserPaint	315.
LaserWorks	195.
Miles Computing	
Mac The Ripper, Orchestra of Fonts, People-Places-Things, or Taking Care of Business *(each)*	27.
Mindscape ComicWorks	47.
GraphicWorks 1.1	87.
Olduvai Software	
Post-ART *(Three Disk Set)* *Special*	35.
Silicon Beach Software	
SuperPaint	79.
Silicon Press	41.
Solutions International	
The Curator *(Catalog Your Art)*	89.
Springboard Certificate Maker	35.
Symmetry PictureBase	59.
T/Maker	
Click Art Letters I, Letters II, Personal Graphics, Publications, Effects, Business Image, or Holidays *(each)*	28.
Christian Images	38.
Click Art Laser Fonts: Plymouth, Bombay, or Seville *(each)*	45.

CAD Products

Apple Computer MacDraw	159.
Challenger Software	
Mac 3D *(Enhanced Version 2.0)*	119.
Cricket Software Cricket Draw	175.
Enabling Technologies Easy 3D	79.
Professional 3D	199.
Innovative Data Design	
MacDraft 1.2A	155.
Silicon Beach Software Super 3D	159.
Super 3D Enhanced *(Mac II)*	249.

Educational/Creative Software

Baron's Baron's SAT	35.
Bogas Productions Studio Session	52.
Broderbund Sensei Geometry Calculus or Physics	63.
Davidson & Associates Speed Reader II	39.
Math Blaster or Word Attack!	28.
Electronic Arts	
Deluxe Music Construction Set V2.0	62.
1st Byte/Electronic Arts	
Kid Talk, Speller Bee, First Shapes, or Math Talk	32.
Mathtalk Fractions, First Letters & Words, or Smoothtalker	32.
Great Wave Software	
KidsTime, TimeMasters or NumberMaze	27.
Concertware+ 4.0	39.
Concertware+ MIDI 4.0	79.
Hayden MusicWorks	29.
Score Improvement System for the SAT	58.
Micro: Maps MacAtlas Paint Version *(MacPaint Format)*	32.
MacAtlas Professional *(PICT/MacDraw Version)*	129.
Mindscape Perfect Score SAT w/The Perfect College	46.
Nordic Software	
MacKids Educational Programs *(each)* *Special*	29.
Rubicon Publishing	
Dinner at Eight-Silver Palate Bundle	51.
Simon & Schuster Typing Tutor IV	35.
Speed Reading Tutor IV	32.
Springboard	
Early Games for Young Children or Easy as ABC	28.

Game Software

Accolade Hard Ball	24.
Activision Shanghai or Hacker II	24.
Hacker	16.
Portal	32.
Artworx Bridge 5.0	22.
Avalon Hill Mac Pro Football	29.
Broderbund Ancient Art of War	27.
Bullseye Software	
Fokker TriPlane Flight Simulator	33.
Ferrari Grand Prix	33.
Electronic Arts Starfleet I	37.
Venture's Business Simulator	49.
ChessMaster 2000 or Patton vs Rommel	29.
Archon, One-On-One, Pinball Construction Set, Seven Cities of Gold, Software Golden Oldies or SkyFox *(each)*	15.
EPYX Winter Games or Sub Battle Simulator	24.
Hayden Software Sargon III	29.
Infinity Software, LTD.	
Grand Slam Tennis	27.
World Cup Soccer	27.
Go	22.
Infocom	
Ballyhoo, Bureaucracy, Hollywood Hyjinx, Leather Goddesses of Phobos, Moon Mist, Nord & Bert, Plundered Hearts, Stationfall, The Lurking Horror, Trinity, or Zork I *(each)*	24.
Beyond Zork	32.
Hitchhiker's Guide to The Galaxy	18.
Zork Trilogy	44.
Microsoft Flight Simulator 1.0	32.
Miles Computing Inc.	
The Fool's Errand or Downhill Racer	27.
Mindscape	
Balance of Power or Crossword Magic	32.
Deja Vu: A Nightmare Comes True	32.
King Of Chicago or Shadowgate	32.
The Uninvited or Siboot	32.
Practical Computer Applications	
MacGolf 2.0 or MacRacquetball	36.
MacCourses	34.
Psion	
Psion Chess *(3D & Multi-Lingual)*	31.
Sierra On-Line Space Quest	30.
King's Quest I, II, or III *(each)*	30.
Silicon Beach Software	
Apache Strike or Beyond Dark Castle	27.
Enchanted Scepters	21.
Dark Castle	27.
World Builder	41.
Simon & Schuster	
Star Trek *(The Kobayashi Adventure)*	24.
Sir-Tech Mac Wizardry	35.
Sphere, Inc.	
GATO, Orbiter, or Falcon	26.
XOR Software NFL Challenge	65.

. . . Positively A Plus!

Disk Drives/Hard Disks/Upgrades

AST Research	
AST fAST-20 *(20MB Ext. for MacPlus, SE and Mac II)*	859.
AST-2000 *(20MB Ext. with 20MB Tape for MacPlus & Mac SE)*	1395.
AST-4000 *(74MB Ext. with 60MB Tape for MacPlus & Mac SE)*	3695.
Mac86 Co-Processor *(Mac SE)*	419.
Mac286 Co-Processor *(Mac II)*	i049.
Central Point	
Central Point 800K External Drive	185.
Dove Computer Corporation	
MacSnap Model 524 *(512K to 1MB Upgrade)*	139.
MacSnap Model 524S *(512K to 1MB Upgrade w/SCSI Port)*	239.
MacSnap Model 548 *(512K to 2MB Upgrade)*	369.
MacSnap Model 548S *(512K to 2MB Upgrade w/SCSI Port)*	429.
MacSnap 2S or 2H *(1MB to 2.5MB Upgrade for MacPlus or Mac SE)*	449.
MacSnap 4S or 4H *(1MB to 4MB Upgrade for MacPlus or Mac SE)*	879.
MacSnap Toolkit *(Wrench, Case Cracker & Grounding Set)*	16.
Ehman Engineering	
Ehman 800K External Disk Drive	189.
First Class Peripherals	
Sider C-46 *(40MB Hard Drive with 60MB Tape for MacPlus/SE or Mac II)*	1399.
General Computer Corporation	
FX/20 *(20MB External Hard Drive for MacPlus)*	649.
FX/40 *(40MB External Hard Drive for MacPlus)*	889.
FI/40 *(40MB Internal Hard Drive for Mac SE)*	889.
HyperCharger 020	Call
MacMemory, Inc.	
Turbo SE *(16 Mhz 68000 Accelerator for the Mac SE)*	399.
Motorola 68881 *(Math Coprocessor for Turbo SE)*	349.
MaxPlus Mega *(2MB Upgrade with 1MB Chips for MacPlus)*	345.
Megabyte SIMMS for the MacPlus, Mac SE, Mac II, TurboMax and Turbo SE equipped Mac:	
MultiSIMMs 2MB Set *(1MB to 2.5MB Upgrade)*	Call
MultiSIMMs 4MB Set *(1MB to 4MB Upgrade)*	Call
Personal Computer Peripherals	
Beige or Platinum Color. Optional Built-In Modems Available.	
MacBottom HD-21 *(20+Mb SCSI Hard Disk)* *Special*	759.
MacBottom HD-32 *(32Mb SCSI Hard Disk)* *Special*	889.
MacBottom HD-45 *(45Mb SCSI Hard Disk)* *Special*	1149.
MacBottom 20 *(20+Mb Serial Hard Disk for Mac 512k & MacPlus)*	855.

Laser Printers & Digitizers

AST Research	
TurboLaser/Mac	3039.
TurboScan *(Optically Scans & Digitizes at 300 Dots-Per-Inch)*	1385.
General Computer Corporation	
Personal Laser Printer	1879.
Impulse	
Impulse *(MacNifty)* Audio Digitizer V2.0 w/SoundCap	149.
Koala Technologies Corp.	
MacVision *(Digitizer)*	169.
New Image Technology	
Magic Digitizer *(Mac 128/512k or MacPlus Version)*	249.
Summagraphics MacTablet 12x12 size	379.
ThunderWare	
ThunderScan V4.0 with Power Port *(Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)*	199.

Accessories

Bech-Tech	
Fanny Mac *(Beige or Platinum)*	69.
Cambridge Automation	
Numeric Turbo	99.
Central Products	
MacOpener *(All In One Mac Tool)*	16.
Curtis Manufacturing	
Diamond-Surge Suppressor-SP-1	29.
Emerald-Surge Suppressor-SP-2	36.
Ruby-Surge Suppressor-SPF-2	55.
Sapphire-Surge Suppressor-SPF-1	47.
Ergotron	
MacTilt or MacTilt SE *(Platinum Color)*	69.
Mouse Cleaner 360°	15.
I/O Design	
Mac Luggage Available in Navy or Platinum Gray	
Macinware Plus Carrying Case	64.
Macinware SE Carrying Case	74.
Imageware II Carrying Case	44.
Kalmar Designs	
Teakwood Roll-Top Disk Cases:	
Micro Cabinet *(holds 45 disks)*	14.
Double Micro Cabinet *(holds 60 disks)*	20.
Triple Micro Cabinet *(holds 135 disks)*	28.
Kensington	
External Disk Drive Cover	8.
Mouse Pocket *(Reg. or ADB)*	8.
Mouseway *(Mousepad)*	8.
ImageWriter or ImageWriter II Cover	9.
Macintosh (Plus) Dust Cover	9.
Mouse Cleaning Kit w/Pocket	17.
Disk Drive Cleaning Kit	20.
Tilt/Swivel	22.
Universal Copy Stand	23.
Apple Security Kit	34.
Polarizing Filter	33.
Printer Muffler 80	38.
Printer Muffler 132	51.
Control Center	63.
System Saver Mac *(Beige or Platinum)*	64.
A/B Box *(MacPlus Only)*	63.
Turbo Mouse *(Reg. or ADB)*	82.
Mouse Systems	
A+ Mouse *(MacPlus)*	69.
A+ ADB Mouse *(Mac SE/Mac II)*	89.
Moustrak	
MousePad 7"x9" Size	8.
MousePad 9"x11" Size	9.
Nutmeg Systems	
Nutmeg 15" Monitor *(Displays One Full Page)*	1379.
Nutmeg 19" Monitor *(Displays Two Full Pages)*	1529.
Orange Micro	
Grappler C/Mac/GS *(Parallel Interface for the Mac)*	65.
Nuvotech	
EasyNet *(Specify Din 8 or DB-9)*	28.
Ribbons Unlimited	
Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
ImageWriter Ribbon-Black	4.50
ImageWriter Ribbon-Color	5.
ImageWriter Rainbow Pack *(6 Colors)*	25.
ImageWriter II-Four Color Ribbon	12.
SoftStyle	
MacEnhancer	175.
The Madson Line	
Professional Series Carry Cases In Black Ballistic Nylon	
Mac(Plus) Carry Case	79.
Mac SE Carry Case	99.
ImageWriter I (II) Carry Case	75.

Blank Media

Single Sided 3½" Diskettes	
BASF 3½" SS/DD Disks *(box of 5)*	8.
Bulk *(Sony)* 3½" SS/DD Disks *(10)*	12.
Sony 3½" SS/DD Disks *(box of 10)*	14.
Centech 3½" SS/DD Color Disks *(box of 10)*	16.
Fuji 3½" SS/DD Disks *(box of 10)*	14.
Maxell 3½" SS/DD Disks *(box of 10)*	13.
Verbatim 3½" SS/DD Disks *(box of 10)*	13.
3M 3½" SS/DD Disks *(box of 10)*	14.
C.Itoh Color Disks SS/DD *(box of 10)*	22.
Double Sided 3½" Diskettes	
BASF 3½" DS/DD Disks *(box of 5)*	9.
Bulk *(Sony)* 3½" DS/DD *(10)*	16.
Centech 3½" DS/DD Color Disks *(box of 10)*	19.
Sony 3½" DS/DD Disks *(box of 10)*	18.
Fuji 3½" DS/DD Disks *(box of 10)*	19.
Maxell 3½" DS/DD Disks *(box of 10)*	20.
Verbatim 3½" DS/DD Disks *(box of 10)*	20.
3M 3½" DS/DD Disks *(box of 10)*	20.
C.Itoh Color Disks DS/DD *(box of 10)*	25.

Modems

Hayes Microcomputing	
Smartmodem 1200	299.
Smartmodem 1200 Mac w/Smartcom II & Cable	359.
Smartmodem 2400	449.
Transet 1000-128K	269.
Transet 1000-512K	359.
Transet 1000 Mac Accessory Kit	29.
InterBridge *(Connect Appletalk Networks)*	599.
Migent	
Migent Pocket Modem *(ext. 300/1200 Baud)*	169.
Prometheus	
Promodem 1200 *(Hayes Compatible)*	239.
Promodem 2400 *(Hayes Compatible)*	309.
Mac Pack w/Procom M and Cable *(Specify Mac or MacPlus)*	49.
U.S. Robotics	
Courier 1200 *(Hayes Compatible)*	199.
Courier 2400 *(Hayes Compatible)*	349.
Courier 2400E *(Hayes Compatible)*	409.
Courier HST 9600 *(Hayes Compatible)*	689.

800/832-3201

Customer Service (203) 378-3662
Monday thru Friday 9 A.M. to 9 P.M.
Saturdays 10 A.M. to 6 P.M. *(Eastern Time)*

OUR POLICIES

- We accept MASTERCARD and VISA with no added surcharge.
- Your credit card is not charged until we ship.
- If we must ship a partial order the shipment that completes the order is sent freight free.
- If you are ordering by mail, we accept private and company checks. With MASTERCARD and VISA orders include card number and expiration date. Connecticut residents add 7.5% sales tax.
- Locations more than 1 day away shipped via Federal Express Rush-Air-Delivery.
- Sorry, we cannot accept COD orders.

SHIPPING

- **Continental United States:** Add $3.00 per order to cover Federal Express Rush-Air-Delivery. APO/FPO orders shipped 1st Class Mail *(add 3% $5.00 Min charge)*. **Alaska, Hawaii and Outside Continental US:** call or write for information.

RETURNS

- Defective software will be replaced immediately by the same item. Defective hardware will be replaced or repaired at our own discretion. Call customer service at *(203) 378-3662* to obtain a Return Authorization Number before returning goods for replacement. Products purchased in error subject to a 20% restocking fee.

All items subject to availability. Prices subject to change without notice.

Now Shipping Rush-Air-Delivery by FEDERAL EXPRESS®

PROGRAMS PLUS

75 Research Drive
Stratford, Connecticut 06497
800/832-3201

© Copyright 1987 Programs Plus, Inc.

To the thousands of Macintosh™ users who find themselves wishing there was a personal printer that lived up to their personal computer.

Including the executives, entrepreneurs, academics and other professionals looking for an affordable entree into the world of desktop publishing.

General Computer presents the reassuring paradox you see illustrated on these pages: the first affordable laser printer that prints like it costs thousands more.

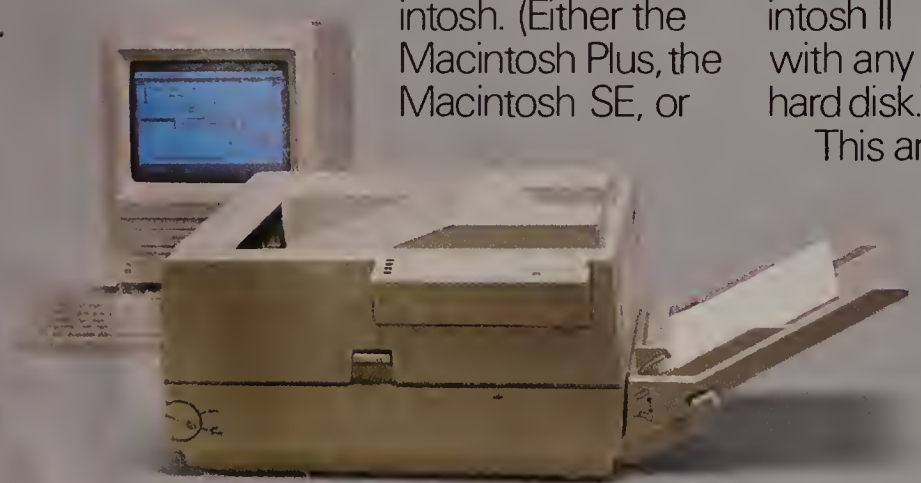
INTRODUCING THE PERSONAL LASERPRINTER.

As the documents shown here demonstrate, the General Computer Personal LaserPrinter™ (PLP™) concedes nothing in printing capability to systems selling for twice its price.

If that still seems hard to believe, consider this. Until now, anyone who bought a laser printer was also buying a computer. Because laser printers have always needed a processor, memory and other expensive hardware to create a printable page.

Our laser printer, on the other hand, eliminates a great deal of this expensive hardware in favor of ingenious software.

Software that allows the printer's imaging to be performed by the computer you already own: the Macintosh. (Either the Macintosh Plus, the Macintosh SE, or the Macintosh II with any hard disk.)



This arrangement also means the PLP is much more compact than other laser printers. (An almost diminutive 16″ x 16 ½″ x 9″.)

And having fewer parts, much less likely to need repairs.



WHICH WAS PRINTED ON WHICH ON OUR

THE PROOF IS IN THE PRINTING.

As you can see, a case could easily be made for buying the PLP on economics alone. But that would be selling it short.

Because the ultimate measure of any printer is how well it prints.

*In Illinois, call (800) 854-9737 In Canada, (800) 263-1405 ©1987 General Computer Corp. The General Computer logo is a registered trademark of General Computer Corp. Personal LaserPrinter and PLP are trademarks of General Computer Corp. Computer, Inc. Manufacturer's suggested retail price $2599 For dealer inquiries call (617) 499-4961 or (617) 499-4952 The documents above were created with PageMaker 1.2

The newsletter of personal money management

THE PRUDENT Investor

Vol. V
No. 2
July 1987

Time to Return to Gold?

There's probably no better hedge against inflation. Gold is *the* internationally recognized medium of exchange. It's completely portable. And, unlike paper money, it has inherent value. But is it for you?

In times of economic or political turmoil people turn again and again to gold.

That's what makes gold prices go up in times of inflation. And why gold moves up when world peace is threatened.

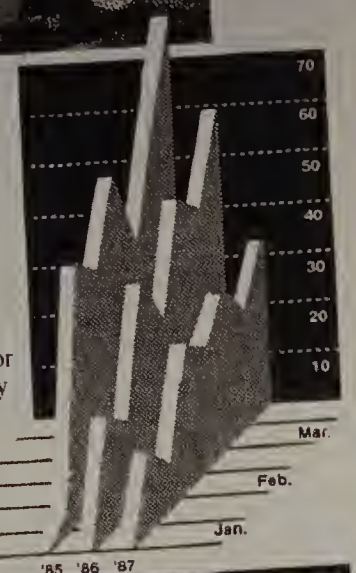
As an investor, you have five basic ways to purchase gold.

1. Gold futures, like all futures contracts, are basically closed-ended speculations intended for sophisticated traders.

2. Gold stocks. Shares in mines are traded on all major exchanges. Some, especially South African mine shares, pay substantial dividends. (This is due to the volatile political situation there.)

3. Gold bullion can be bought at all large brokerage houses. These firms also store and insure bullion.

continued on page 12



Technical Analysis: Science or Sorcery? See page 6



The Rising Fortunes of the Humble Apple

Consumer demand has mushroomed in recent months for fresh fruit and produce.

What are the best plays in this trend for investors?

Dr. Vic Scallione, of the Washington State Department of Agriculture says

continued on page 3

Picking Your Stockbroker

If you happen to be picking a stockbroker for the first time, a good way to begin is with some solid recommendations.

Ask your lawyer, accountant, or banker for the name of a stockbroker, or a brokerage firm, that could take on your account.

Some investors suggest you choose several brokers at different firms and let each handle a part of your portfolio until you decide on the right one.

The broker you choose should have a philosophy about investment that is as close as possible to your own. Find out how he

continued on page 5

Amex Stocks	4	*Real Estate*	14
Commodities	8	*Special Report*	9
NYSE	13	*Technical Analysis*	6
OTC Stocks	13	*Treasury Issues*	12

Avoiding Wall Street's blind alleys: A Prudent Investor Special Report. See p. 9

And a draft mode that lets you rapidly print out works-in-progress for editing and revision by others.

Then, once all the revisions are complete, the PLP quietly provides extraordinary finished output.

Near-typeset quality presentations, newsletters, memos and reports produced with software like Microsoft's Word and Aldus' PageMaker.® All printed with a new generation of laser technology that turns out richer contrasts than ever before.

AN INVITATION TO SKEPTICS.

In other words, the PLP does for printed communications what the Macintosh did for personal computing.

It provides a sophisticated, yet affordable tool for anyone who needs to manage large amounts of information—and wants to work smarter and more creatively in the process.

So to answer the question we began with: the PLP printed the document that appears on the right. But you don't have to take our word for it.

We invite you to make your own comparisons through a PLP demonstration at any authorized General Computer dealer. Where you'll also be able to compare another pair of documents that are far easier to tell apart:

A Personal LaserPrinter price tag. And that of any other laser printer of equal quality.

For the name of the dealer nearest you, call (800) 634-9737.*

A $5000 LASER PRINTER? S FOR $2600?

Like vastly more expensive laser printers, the PLP allows you to print scanned photographs and illustrations, high-resolution graphics created with software like MacDraw® and Microsoft's® Excel, and otherwise juggle words and pictures until you have them exactly where you want them.

But the PLP also provides assistance even these vastly more expensive printers don't.

Including a choice of Bitstream® fonts limited only by your hard disk's capacity to store them. (Fonts you can easily adjust to any point size, or fraction thereof.)

A preview feature that lets you review each page before you print it.

GENERAL COMPUTER

Microsoft is a registered trademark of Microsoft Corp. PageMaker is a registered trademark of Aldus Corp. Bitstream is a registered trademark of Bitstream Inc. MacDraw is a registered trademark of Apple Computer, Inc. Macintosh is a trademark of Apple

Circle 143 on reader service card



I expect better, more-intelligent integration of desktop publishing and databases for things like printing phone books or catalogs.

the past we put together spreadsheets, word processors, and database managers. Today there are new integrated categories: we may start seeing programs that can take a blank form received in the mail, scan it in, and then fill it out by recognizing the fields and retrieving the information. Or take a filled-in form and scan it with all its data right into the database. I expect better, more-intelligent integration of desktop publishing and databases for things like printing phone books or catalogs.

Have you noted any changes in the Mac community?

Yes. The coat-and-tie ratio. That is, the number of people that come to the Macworld Expo in a coat and tie. In the old days you knew everybody personally. Now there are big corporations, and people in coats and ties. There's still a glimmer, though, still some Macintosh personality. At PC Expo there's zero.

Do you see parallels between the 1982/83 IBM PC boom and what is going on now with the Mac?

Yes and no. Reaching the $1000 price for an IBM PC clone set off the PC boom. The Mac boom is due to functionality. The Mac passes a threshold of performance in certain applications.

There are some similar areas. Personal computers have begun to enhance basic things that we all do every day. They're becoming things that we have to have in an office or a business, like a photocopier or a cash register.

How do you view the conflict between *Microsoft Windows* and the Macintosh operating system?

As a software publisher, we recognize that both systems are viable. The user's choice between them is going to depend on things such as installed base in the user's company, or the system's price, or the user's desire to use a particular piece of software. Remember that there are ten times as many PCs as there are Macs. Frankly, I use a PC more than a Mac because I started with it, and I'm more fluent with the PC. It's like speaking a language. I have years invested in it, and the changeover would be too costly. If the PC is perfect for my application, why should I switch?

How do you characterize the two operating environments: the Mac and the PC?

Windows is becoming faster, closer to the Mac. The problem with *Windows* is the

(continues)

HARRIER STRIKE MISSION II

Harrier Jump Jet Flight Combat Simulator

NOW SHIPPING!

The long-awaited sequel to the original Harrier Strike is now available, and doesn't stop at mere compatibility with the new Macintoshes—it's a whole new game! Pilot a modern jump jet with weapons of tremendous power in six unique scenarios: enjoy the scenery or take off into five different full-blown battles. Face up to a dozen of the enemy's deadliest fighter jets, tanks, aircraft carriers, destroyer patrol boats, and more. Realistic fill-in graphics and authentic digitized sound. **Fierce combat action** in a realistic **Harrier Jump Jet Flight Simulator.**

MILES Computing

Miles Computing, Inc. Entertainment Software Division, 7741 Alabama Avenue, Suite 2, Canoga Park, CA 91304 • (818) 341-1411

Circle 37 on reader service card

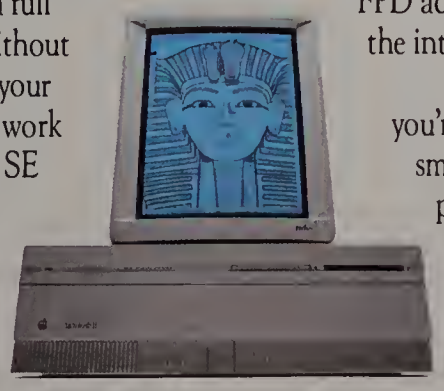
The Ultimate Tool Of the Trade.



If you want to do your own Desktop Publishing you need a Macintosh™ computer and a LaserWriter® printer.

They are, after all, the standard tools of the trade. But if you're truly serious about Desktop Publishing, you need the ultimate tool of the trade: the Radius Full Page Display™ (FPD).

With an FPD you can see a full 8½"x 11" page at one time. Without scrolling through or reducing your document. Which means you work a lot faster. And now, on your SE or Macintosh II, you can pan across two pages at a time.



The FPD's 640 x 864 pixel screen provides a flicker-free, stable, virtually paper-like page and a rich high-detail picture. Although its screen is 8½"x 11," its footprint is only 11"x 14," which means the FPD gives you a bigger screen, not a smaller desk.

Easily installed on a Macintosh Plus, SE or Macintosh II, the Radius Full Page Display is compatible with all standard Macintosh software. Which means your software investment is safe. In fact, it's actually more valuable.

The FPD is not a replacement for the screen in your Macintosh. It's an enhancement. Because the FPD actually works in combination with the internal screen in your Macintosh.

But, no matter what application you're working in, you'll work faster, smarter and more productively. And print a lot less because you can see full pages as you design them.

With PageMaker, you can use the FPD for page layouts and the Macintosh screen for your tools.

In Microsoft® Excel, you can place a spreadsheet on your FPD and a linked graph on your Macintosh screen.

The Radius Full Page Display has achieved critical acclaim from both enthusiasts and the trade press.

If you review the reviews of the experts, editors and evangelists of the Desktop Publishing industry, almost to a person, the Radius Full Page Display is regarded as one of the major hardware advancements in Desktop Publishing.

The FPD was designed by key members of the original Macintosh team. It preserves the design integrity of your Macintosh.

For serious Desktop Publishing, it is the ultimate tool of the trade.

Circle 577 on reader service card

radius™

For the name of the Radius dealer nearest you call 1-408-434-1010.

© 1987 Radius, Inc. Radius and Radius Full Page Display are trademarks of Radius, Inc. Macintosh is a trademark and LaserWriter is a registered trademark of Apple Computer, Inc. PageMaker is a registered trademark of Aldus Corporation. Microsoft is a registered trademark of Microsoft Corporation.



If PCs are so much cheaper, the Mac will miss out on a large share of the entry-level market.

retrofit issue. When Apple comes out with a new Mac you can retrofit the old Macs with new system software and boards: there is an upgrade path. The Mac also has the advantages of its graphics interface and ease of learning.

IBM has no control over its market, so continuity of systems and software is a big issue. IBM looks at a market as a large automobile manufacturer does—when a machine is out of date you don't upgrade it, you throw it out or relegate it to the home.

Also, the 8088 CPU on the PC is a problem, especially for graphics. Microsoft has said that it will come out with products for high-end users—on the 80286 and the 80386. Even if *Windows* runs only on the more powerful machines, Microsoft expects it to provide a competitive alternative to the Mac because consumers will lean toward a PC that's a successor to what they already own.

Will you still develop for the PC?

Yes. About two years ago the Mac market took a dive. We were safe because we also had general PC products. So the Mac is wonderful, but the PC has a place in the market, too. You can go out and buy one for $600.

Does the Mac cost too much money?

Yes. There is no low-end Mac. The Mac is best with the first-time user—I have no hesitation in recommending a Mac for people just entering computing—but those first-time users don't want to spend $1500 when they can go down to the local Radio Shack and buy a PC clone for $600.

Until there's a Mac available for under $1000 we won't see it sold as an impulse buy, or as the child's first computer for school. The truth is that *any* personal computer provides more productivity than an unaided person had before. For a new computer user then, the relative difference in productivity between the Mac and the PC is small, unless it's in a special area such as DTP on the Mac. If PCs are so much cheaper, the Mac will miss out on a large share of the entry-level market.

At T/Maker, we work with both machines, but everyone in the company except me uses the Mac more than the PC. Few firms can afford to provide employees with two computers.

What do you think about Apple's future?

There is a problem with a company that big. You can't judge its tomorrow by the

(continues)

MacLuggage™

Macinware SE™ $129.95
for the entire
Macintosh SE™ System



Go Ahead,
Take It ALL!



1. 9″ x 9″ x 3″ Padded Pocket for External Disk Drive, Modem, or Accessories.
2. Padded Compartment for Mouse and Cords.
3. Padded Compartment fits ANY Apple Keyboard.
4. Padded Flap separates Hard Disk from Computer.
5. ½″ High Density Foam for Maximum Protection.
6. Platinum Grey or Navy Blue Cordura Nylon Outer Shell.
7. Heavy Duty Metal Hardware Throughout.
8. Stress Points Cross Stitched and Riveted for Added Support.
9. Padded Handle for Comfort, features Velcro Enclosure.
10. 2″ Stiff Nylon Webbing Maintains Shape.
11. Slip Stop Shoulder Pad.
12. Outer Handle to Assist in Shoulder Carrying.

All Trademarks Acknowledged

Call 1-800-241-2122
I/O Design, Inc. • P.O. Box 156 • Exton, PA 19341
215-524-7277

See Us At Macworld Expo, Booth #1210

Circle 530 on reader service card

Your Reasons for Buying Radius Have Just Doubled.



Radius Two Page Display and Tear-off Menus

From the makers of the Radius Full Page Display™ comes the Radius Two Page Display.™

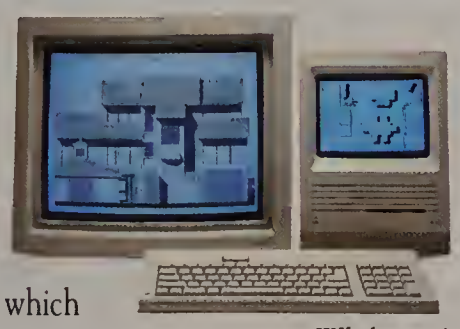
The Two Page Display for the Macintosh SE is just what you'd expect from Radius: innovative technology that is totally Macintosh in look, feel and spirit.

When you first turn on the Two Page Display (TPD), you are in a sea of open white space. An almost infinite canvas for your imagination.

Desktop Publishers can work across two 8½" x 11" facing pages.

Engineers, architects and designers can create full-scale B-size drawings.

The 19" high-resolution monochrome screen yields an impressive 1152 x 864 pixels with a consistently stable image which shows flicker-free, paper-like pages.



The refresh rate is so fast that eye strain and fatigue are virtually non-existent. Graphics are crisp and clear. Text is clean and inviting to read.

But the Two Page Display offers you a lot more than just a great view. With a Radius TPD, you can position menus anywhere on your screen. Or, on either screen. Tear-off Menus offer you flexibility Macintosh style.

Just scroll down to the side of any open menu, continue to hold down the mouse button, and drag the entire menu to any position you like. Which means menus become windows unto themselves. And big timesavers when doing detailed graphic work.

To remove a Tear-off Menu from the screen, treat it like the window it is. Just click the close box.

While you're looking at the Radius TPD, take a glance at the Radius Accelerator.™ The Accelerator quadruples the speed of all your Macintosh applications. And, you're assured of total compatibility between your Radius Accelerator, Radius Display and your Macintosh. They're made for each other. By some very special people.

Every Radius product is designed by key members of the original Macintosh team. Hence the painstaking detail to both Macintosh electronics and Macintosh aesthetics.

After all, we have a very special heritage to live up to.

Which is why Radius is rapidly earning acceptance as the industry standard.

And that's just one more reason why you should visit your Authorized Radius dealer.

Today.

radius™

For the name of the Radius dealer nearest you call 1-408-434-1010.

© 1987 Radius, Inc. Radius, Radius Full Page Display, Radius Two Page Display and Radius Accelerator are trademarks of Radius, Inc. Macintosh is a trademark of Apple Computer, Inc. Screen art courtesy of Cycle Composites, Inc. and Innovative Data Design

Circle 585 on reader service card



Fonts are a tough market.... Type is not intuitive to the general computer user.

products it produces today. Especially when there have been so many senior-management changes in the company. I'm certain there is no longer the same sense of spirit at the company there once was; it has lost personality. At the tenth anniversary party one of the primary topics of discussion was the stock price, not the technology or the people. I wouldn't want my company's future tied to Apple, or to any one company, for that matter.

You work with both NeXT (Steve Jobs's company) and Apple, despite a certain animosity between the two. How do you manage that successfully?

We haven't completely avoided all problems. I'm sort of a Hong Kong between China and Taiwan. Each side has value to the other, but they're not speaking. Politically we serve as a conduit–Steve couldn't have published *WriteNow* himself. What would he do–go to Macworld Expo and do demos in Apple's booth? I don't even know if Steve drives through Cupertino these days.

I remember once talking to an Apple product manager who said that he hated seeing royalties on a great Mac product like *WriteNow* going into Steve Jobs's pocket. There is no way to answer comments like that.

Nevertheless, a lot of respect remains between the two companies. The people who wrote *WriteNow* are at NeXT, yet they identify with the Mac and are proud of what they did for an Apple computer.

At first some people at Apple were afraid I would take their prototype equipment and deliver it to Steve, but those suspicions have passed. They recognized that we have nondisclosures on both sides, and a lot of integrity about that. And Steve Jobs is not really interested in what the next Apple machine will be. If he did want technical information, I'm sure he has better sources for technical detail than T/Maker.

What is the impact of Apple's bundling *HyperCard* with the Mac?

The impact depends upon what a company publishes. Apple used to bundle *MacWrite* and *MacPaint*. That was great for T/Maker, because then all owners of the Mac could use our *Click Art*. But there wasn't any market for third-party word processors or paint programs.

It's not a question of whether Apple should provide software, but rather what kind–enhancements to the system or true applications. The system improvements enhance consumers' ability to use the machine, but application development stunts third-party development.

Will a third-party industry develop to provide *HyperCard* stacks? Or will stacks be akin to shareware or desk accessories?

If there is a market for clip art, there is a market for stacks.

Low-volume or accessory software is something someone can always make money from. Maybe not Lotus, because of the investment it has to make in a product, but smaller companies may have profitable applications.

T/Maker was one of the first companies to offer fonts for the Macintosh. What direction do you see for fonts?

Fonts are a tough market. The user is not as interested in buying a specific kind of typeface as we imagine. Type is not intuitive to the general computer user. The average person working with type uses whatever is available; most don't understand the value of different fonts, when to use them, when to mix them, and so on.

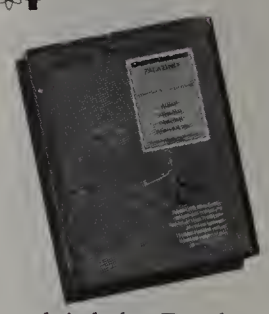
We sell both bit-mapped fonts and laser fonts. Today most font sales are for laser fonts. We still sell a lot of bit-mapped fonts to people with ImageWriters who want to make flyers or invitations. But Adobe has a lock on the high-end font market today; it has some proprietary algorithms, which allow it to make the best laser fonts.

(continues)

The Adobe Type Library Gives You More Ways To Make A Difference.

Each Adobe Type Library package contains several typefaces from the families shown numbered below. Order yours today.

1 Palatino®
2 ITC Bookman®
3 *ITC Zapf Chancery® Medium Italic*
ITC Zapf Dingbats® ✈❊ ✦❞✎
4 ITC Avant Garde Gothic®
5 New Century Schoolbook
6 Optima®
7 ITC Souvenir®
8 ITC Lubalin Graph®
9 ITC Garamond®
10 ITC American Typewriter®
ITC MACHINE®
11 ITC Benguiat®
ITC Friz Quadrata
12 Glypha®
13 Helvetica® Light, **Black**
14 Helvetica® Condensed
15 Trump Mediæval®
16 Melior®
17 ITC Galliard®
18 ITC New Baskerville®
19 ITC Korinna®
20 Goudy Old Style
21 Sonata™
22 Century Old Style
23 ITC Franklin Gothic®
24 ITC Cheltenham®
25 *Park Avenue*
26 Bodoni
27 Letter Gothic
28 Prestige Elite
29 ORATOR
30 News Gothic
31 ITC Tiffany
32 **Cooper Black**
33 **STENCIL** *Brush Script* Hobo
34 **Aachen** University Roman **Revue**
Freestyle Script
35 Carta™
36 Lucida®
37 Univers®
38 Univers® Condensed
39 Futura® 1
40 Stone™ Serif
41 Stone™ Sans
42 Stone™ Informal

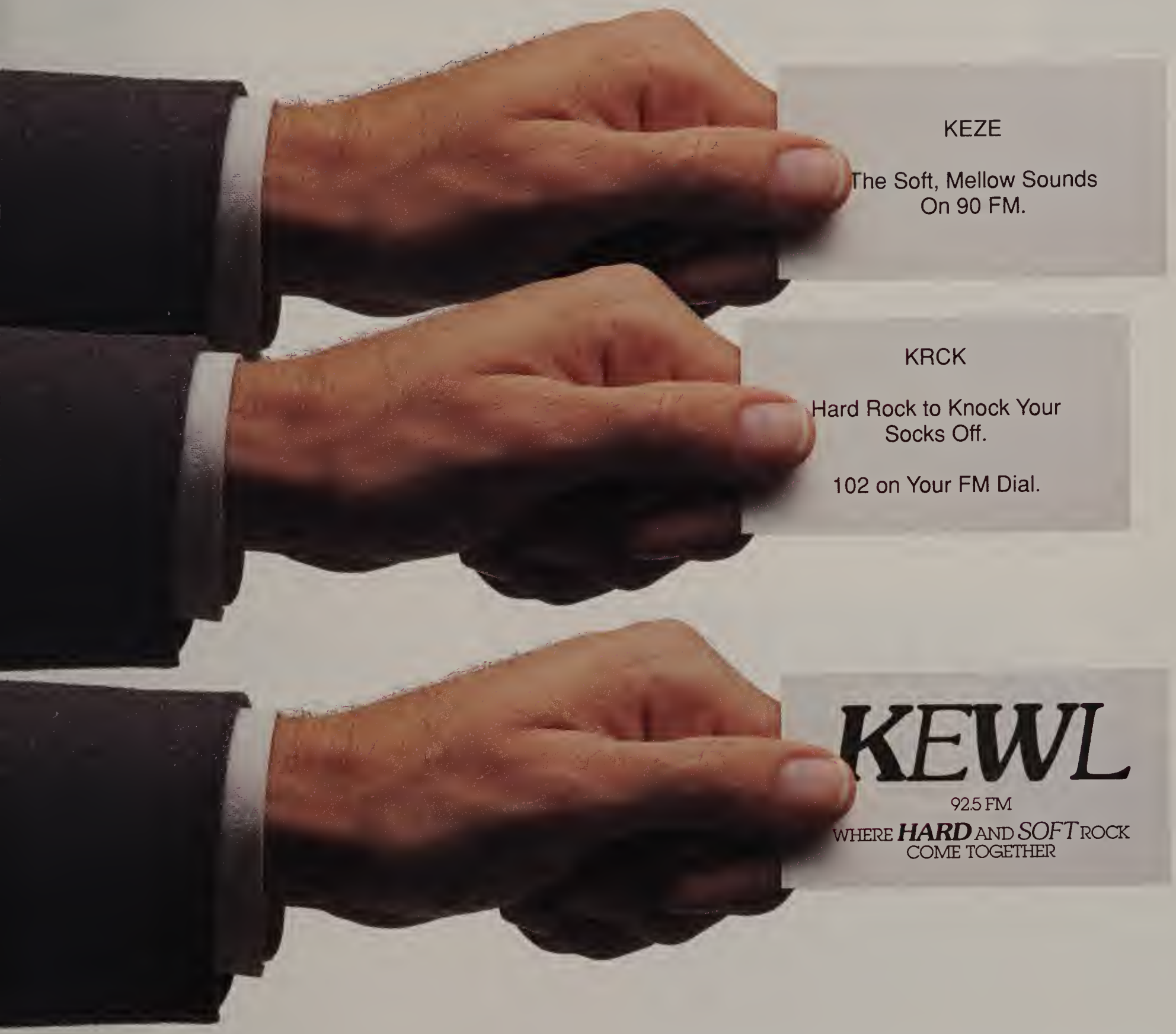


See your nearest Authorized Adobe Dealer or call (800) 29-Adobe. In Alaska and Canada, call (415) 961-4440. *Make a difference with the Adobe Type Library.*

ADOBE SYSTEMS INCORPORATED

All products are registered trademarks or trademarks of their respective manufacturers

If it makes a difference, make a difference with the Adobe Type Library.



The difference is impact.

Using just a few typefaces for everything you do is like wearing the same suit to work everyday. After a while, nobody notices.

But with over 200 typefaces in the Adobe Type Library, it's easy to call attention to everything you do. You can "shout" in a bold display typeface to gain immediate attention. Or "whisper" in delicate typefaces to communicate a mood.

And no matter which Adobe typefaces you choose, you're always getting the best quality. Because each typeface is researched and refined to assure that it's true to the original design. And that it's sharp and reproducible whether it's set as a footnote or a headline.

So why limit yourself? Call now for details on the Adobe Type Library: 800-29-ADOBE; in Alaska and Canada, call 415-961-4400.

Because no matter what type of design it is, nothing makes a difference like Adobe type. Adobe Systems Incorporated, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900.

ADOBE SYSTEMS INCORPORATED

Circle 1 on reader service card



The more fonts people use, the more troublesome it is to design OCR software that reliably recognizes the letterforms.

What about OCR (optical character recognition) software?

Well, the more fonts people use in documents, the more troublesome it is to design software that reliably recognizes the letter forms. Right now it's becoming easier to share information electronically, so I actually see less call for OCR. You just modem a file to someone or send a disk, rather than worrying about whether your company's particular OCR system will read particular fonts.

Your company was also one of the first to produce clip art. What's going on there?

People want more selection at higher resolution. We thought that when scanners became more prevalent, clip art would falter. But having scanners doesn't change a user's ability to input or create quality original art. Scanners are also still expensive. They're quite slow, and it's difficult to make them do what you want.

Our latest clip art is all done with *Adobe Illustrator*. We even chose the same artists Adobe used for its documentation illustration so that our art would be of the highest quality. The laser printer output from this *Illustrator* art is much better than the stuff done with scanners.

Even our bit-mapped packages are designed directly on the Mac with specific resolution and smoothing in mind. Our artists have been doing it that way for three years–I think the resulting images print far better than any scanned-in art of equivalent resolution.

Clip art is funny. There are no barriers to entry–anyone can buy *MacPaint* and a Mac and become our competition–but the questions of product quality, recognition, and breadth of distribution are important.

What are your biggest requests?

Christian images were our number-one request, and our latest package satisfies that demand. Sometimes here in Silicon Valley we think that we're the heart of the universe, but we're really not representative of the world. Religion is a bigger interest elsewhere.

Military and industry is another hot area. But it raises a moral question–whether I want T/Maker to support war efforts by providing clip-art disks of little hand grenades and rockets.

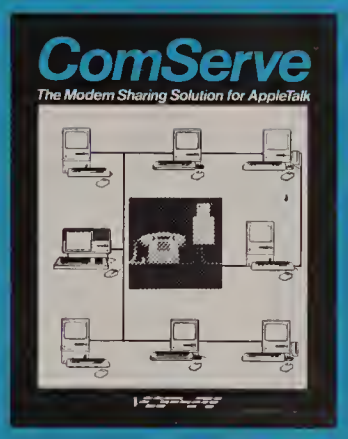
Pornography?

No, we wouldn't do that. Not a company with as many women in it as this one. In fact, *Macworld*'s advertising department

(continues)

Shipping Now!

ComServe
The Modem Sharing Solution for AppleTalk



Clone Your Modem

For less than the cost of another modem, you can offer telecommunications services to everyone on your AppleTalk® network. With ComServe™, you no longer need a modem at each Macintosh™—with all the accompanying wiring complexities and line charges.

- Gain network-wide access to modems, mainframes, and minis.
- Eliminate dedicated hardware. ComServe transparently runs in the background of a Mac. And, it's AppleShare™ compatible.
- Save, at $195 per server. Share expensive, high-speed modems.

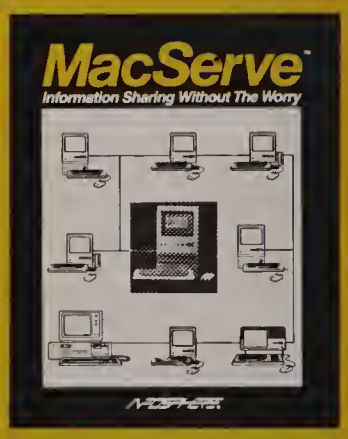
Call now or ask your dealer for ComServe. From Infosphere, the only full-family AppleTalk software vendor.

INFOSPHERE®
4730 SW Macadam Ave—Portland OR 97201
1-800-445-7085

Circle 249 on reader service card

Ask About Rebate Offer!

MacServe
Information Sharing Without The Worry



MACWORLD WORLD CLASS AWARD 1987

Still the Best for Small Nets

Still only $250 per hard disk server for as many user nodes as you like—still the only file sharing solution that offers "Bulletproof" Automatic Crash Recovery so users never lose data. MacServe™ is the most practical choice for small AppleTalk® networks. And that's why MacServe is still the leader with over 30,000 installations.

- Forget dedicated Macs. MacServe runs in the background.
- Grow a network transparently. Add Macs, PCs, hard disks, servers, printers, modems and E-Mail, as you need them.

Call now or ask your dealer for MacServe. From Infosphere, the only full-family AppleTalk software vendor.

INFOSPHERE®
4730 SW Macadam Ave—Portland OR 97201
1-800-445-7085

Circle 316 on reader service card

How Jasmine turned SCSI into a Moving Experience.



You're definitely going to want to move up to MegaDrive – the high speed, SCSI storage device featuring removable 10 megabyte MegaFloppy™ disks. Besides being servo-written and fully interchangeable between MegaDrives, MegaFloppy disks are much more reliable than other removable, mass storage products. In addition, they are easily stored for safe-keeping/security.

MegaDrive is a moving experience for any Macintosh user. Desktop publishers can store fonts, clip art, layouts, and different clients on separate disks. Musicians can use it to catalog sound libraries and samplings.

And the everyday user can finally organize all those floppy disks that have been piling up for so many years.

MegaDrive is also a fast, reliable back-up system which allows you to work directly from your MegaFloppy back-up disks in the event of a hard disk crash.

Better still, everything's backed by a full 1-year warranty. And the high level of service and support you expect from Jasmine.

So make the move.



MegaDrive $999

VISA (Cash/Visa/MasterCard)

To Order Call (415) 621-4339

Remember that Jasmine saves you 40% or more.

MegaFloppy Disks: $39.95 each

MegaFloppy Three-Pack: $109.95*

** Three packs include handy Storage Case*

Technical Specifications: MegaDrive

Access Time	
Track to Track	25 msec.
Average	65 msec.
Maximum Seek– Full Stroke	125 msec.
Average Latency	50 msec.
Mean Time Between Failure	40,000 POH

Visit us at MAC EXPO San Francisco

Every drive is shipped with a technical hotline number to answer any questions. MegaDrive and Jasmine, are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Macintosh is a trademark licensed to Apple Computer, Inc.

Jasmine Technologies, Inc.

555 DeHaro Street, San Francisco, CA 94107

Circle 747 on reader service card



The more fonts people use, the more troublesome it is to design OCR software that reliably recognizes the letterforms.

What about OCR (optical character recognition) software?

Well, the more fonts people use in documents, the more troublesome it is to design software that reliably recognizes the letter forms. Right now it's becoming easier to share information electronically, so I actually see less call for OCR. You just modem a file to someone or send a disk, rather than worrying about whether your company's particular OCR system will read particular fonts.

Your company was also one of the first to produce clip art. What's going on there?

People want more selection at higher resolution. We thought that when scanners became more prevalent, clip art would falter. But having scanners doesn't change a user's ability to input or create quality original art. Scanners are also still expensive. They're quite slow, and it's difficult to make them do what you want.

Our latest clip art is all done with *Adobe Illustrator.* We even chose the same artists Adobe used for its documentation illustration so that our art would be of the highest quality. The laser printer output from this *Illustrator* art is much better than the stuff done with scanners.

Even our bit-mapped packages are designed directly on the Mac with specific resolution and smoothing in mind. Our artists have been doing it that way for three years–I think the resulting images print far better than any scanned-in art of equivalent resolution.

Clip art is funny. There are no barriers to entry–anyone can buy *MacPaint* and a Mac and become our competition–but the questions of product quality, recognition, and breadth of distribution are important.

What are your biggest requests?

Christian images were our number-one request, and our latest package satisfies that demand. Sometimes here in Silicon Valley we think that we're the heart of the universe, but we're really not representative of the world. Religion is a bigger interest elsewhere.

Military and industry is another hot area. But it raises a moral question–whether I want T/Maker to support war efforts by providing clip-art disks of little hand grenades and rockets.

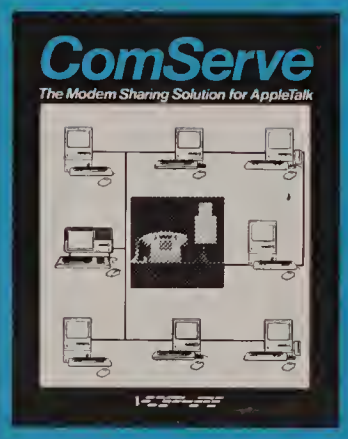
Pornography?

No, we wouldn't do that. Not a company with as many women in it as this one. In fact, *Macworld*'s advertising department

(continues)

Shipping Now!

ComServe
The Modem Sharing Solution for AppleTalk



Clone Your Modem

For less than the cost of another modem, you can offer telecommunications services to everyone on your AppleTalk® network. With ComServe™, you no longer need a modem at each Macintosh™—with all the accompanying wiring complexities and line charges.

- Gain network-wide access to modems, mainframes, and minis.
- Eliminate dedicated hardware. ComServe transparently runs in the background of a Mac. And, it's AppleShare™ compatible.
- Save, at $195 per server. Share expensive, high-speed modems.

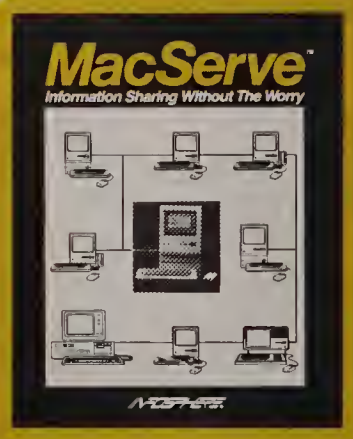
Call now or ask your dealer for ComServe. From Infosphere, the only full-family AppleTalk software vendor.

INFOSPHERE®
4730 SW Macadam Ave—Portland OR 97201
1-800-445-7085

Circle 249 on reader service card

Ask About Rebate Offer!

MacServe
Information Sharing Without The Worry



MACWORLD WORLD CLASS AWARD 1987

Still the Best for Small Nets

Still only $250 per hard disk server for as many user nodes as you like—still the only file sharing solution that offers "Bulletproof" Automatic Crash Recovery so users never lose data. MacServe™ is the most practical choice for small AppleTalk® networks. And that's why MacServe is still the leader with over 30,000 installations.

- Forget dedicated Macs. MacServe runs in the background.
- Grow a network transparently. Add Macs, PCs, hard disks, servers, printers, modems and E-Mail, as you need them.

Call now or ask your dealer for MacServe. From Infosphere, the only full-family AppleTalk software vendor.

INFOSPHERE®
4730 SW Macadam Ave—Portland OR 97201
1-800-445-7085

Circle 316 on reader service card

How Jasmine turned SCSI into a Moving Experience.



You're definitely going to want to move up to MegaDrive—the high speed, SCSI storage device featuring removable 10 megabyte MegaFloppy™ disks. Besides being servo-written and fully interchangeable between MegaDrives, MegaFloppy disks are much more reliable than other removable, mass storage products. In addition, they are easily stored for safe-keeping/security.

MegaDrive is a moving experience for any Macintosh user. Desktop publishers can store fonts, clip art, layouts, and different clients on separate disks. Musicians can use it to catalog sound libraries and samplings.

And the everyday user can finally organize all those floppy disks that have been piling up for so many years.

MegaDrive is also a fast, reliable back-up system which allows you to work directly from your MegaFloppy back-up disks in the event of a hard disk crash.

Better still, everything's backed by a full 1-year warranty. And the high level of service and support you expect from Jasmine.

So make the move.



MegaDrive ***$999***

(Cash/Visa/MasterCard)

To Order Call (415) 621-4339

Remember that Jasmine saves you 40% or more.

MegaFloppy Disks: $39.95 each

MegaFloppy Three-Pack: $109.95*

** Three packs include handy Storage Case*

Technical Specifications: MegaDrive

Access Time	
Track to Track	25 msec.
Average	65 msec.
Maximum Seek—Full Stroke	125 msec.
Average Latency	50 msec.
Mean Time Between Failure	40,000 POH

Visit us at MAC EXPO San Francisco

Every drive is shipped with a technical hotline number to answer any questions. MegaDrive and Jasmine, are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Macintosh is a trademark licensed to Apple Computer, Inc.

Jasmine Technologies, Inc.

555 DeHaro Street, San Francisco, CA 94107

Circle 747 on reader service card

PostScript® Typefaces For Laser Printers

FLUENT LASER FONTS™

- Fifteen Volumes Sold Separately
- Most Typefaces Have Style Variations
- Automatically Downloadable
- Print Any Size Your Program Allows
- Use With Any PostScript Printer
- No Copy Protection
- CALL FOR PRINTED SAMPLES

1 BODONI
2 SANS SERIF
3 RITZ/RIGHT BANK
4 MONTEREY
5 Calligraphy
Regency Script
6 Prelude Script
7 Coventry Script
Zephyr Script
8 Gregorian / Dorovar
9 Кириллица Russian & Ukrainian
10 **Bodoni ULTRA**
11 **SANS SERIF BOLD**
12 **Sans Serif Extra Bold**
13 GATSBY LIGHT
14 MICRO Laser
15 Micro Extend.

CASADYWARE
P. O. Box 223779 Carmel, CA 93922

TRADEMARKS Fluent Fonts Fluent Laser Fonts–CasadyWare Inc Macintosh, LaserWriter ImageWriter–Apple Computer Inc PostScript–Adobe Systems Inc Linotronic–Allied Linotype

FOR ORDERS CALL (800) 331-4321
OR IN CALIF. (800) 851-1986
FOR INFORMATION CALL (408) 646-4660

Circle 757 on reader service card



In an ideal world there would be software to convert bit-mapped clip art into vector outlines, or to fill in gray scales.

wouldn't allow us to print an ad with a *Click Art* version of Michelangelo's David, so we put in a fig leaf for the ad.

What is the difference between PostScript/*Illustrator* clip art and bit-mapped clip art?

If you output our recent bit-mapped *Click Art* on a LaserWriter without altering the size, you couldn't tell the difference between bit maps and PostScript art. Of course, there's no gray-scale shading with bit maps.

The trouble with EPSF clip art is that it can't be used in all applications today. But it's increasingly needed in design and CAD. In our PostScript products, we try to create things that can't be done well in other formats.

PostScript provides advantages for sizing. We've enlarged an image so much that it takes up to nine pages, and it looks just as good as when it's printed in a small size. So we've tried to develop the most useful and popular PostScript images.

Will you do more PostScript-based clip art?

I think so. We find that the individual user wants a large selection of pictures. We have 125 images in the current collection. That brings up the other problem with EPSF: it takes a lot of disk space. Some of the images are so big that they won't fit into the Mac's memory for DTP placement. Most people seem to think the EPSF files are smaller than bit maps, but the EPSF file has all the bit-map information *plus* the PostScript information.

What about high-quality color clip art?

There is always a segment of the market that wants the best and the latest, but the average consumer wants images that print on the LaserWriter and the ImageWriter and can then be photocopied–in other words, no color. We're a consumer software company. The average guy doesn't buy the high-end products.

Is there a market for clip art on CD ROM?

There is an interest, but it is not an immediate focus for us. That's a high-end market, and ours is a general market. As soon as there are more CD ROM drives out there, we'll pay more attention. *Click Art EPS Images* is our first foray into the high-end market.

How about gray-scale clip art?

There are two kinds of clip art products: building blocks for the design professional and finished images for consumers who don't want to spend time designing art. In an ideal world there would be software that could convert the bit map into vector outlines or that could fill in gray scales for vector-based clip art, depending on what the user wanted. But that's not easy to develop.

How long before it's possible to convert bit-mapped images to outlines for LaserWriter output?

Remember that this kind of software will have to compete with what the eye and brain can do–simple things like distinguishing between a square and a circle that are interlaced. An eight-year-old can make that distinction, but it is very difficult for the computer. Add gray scale and noise, and the task becomes much more difficult. The eye automatically filters out the noise. How do you get a computer to recognize what makes up a face? Then there's image complexity. This is going to take some complex code. We're working on it.

(continues)

INTRODUCING 101 MACROS™ FOR EXCEL™

Instead of This . . .



You Can Do This . . .





With This. $69.95 Sugg. Retail

MAKE EXCEL EASIER — *AND* MORE POWERFUL

Now you can have your own on-disk library of shortcuts, utilities, keystroke savers and *mousestroke* savers that will work with *ANY* Excel worksheet. No more dull, repetitive operations, no more pulling down and clicking through multiple menus, no more hours wasted with manual input that could be automated.

Introducing the ultimate collection of 101 pre-typed, ready-to-use, all purpose macros on disk. Imagine being able to:

- Automatically double space and print a worksheet
- Set up and maintain data bases with a single command
- Create slide show presentations
- Add menu-driven financial functions
- Automatically overlay and clean up all the worksheets on the screen with a single keystroke



— Plus 96 more features to save time and multiply the power and ease-of-use of Excel.

With *101 MACROS FOR EXCEL* you can save keystrokes & mousestrokes, save menu steps, save time and automate your worksheet. Whip through complicated menus and worksheet setups with a single keystroke. Eliminate repetitive operations with macros that will move down columns or across cells, changing each cell to your specifications. Operations that previously required several mousestrokes, like swapping columns or inserting rows, can now be done with single keystrokes.

ELIMINATE FRUSTRATION

How many times have you had to go back to the manual to learn how to do some simple function that seems overly complicated in Excel? How often have you waded through charting, database operations and building tables? How often have you wished that you didn't have to wear out your arm reaching for the mouse to perform just about every operation? The macros in *101 MACROS FOR EXCEL* help you out with everything from simple mousestroke and keystroke savers, to sophisticated, interactive macros which "walk you through" more complicated Excel operations.

EASY TO USE

These macros are extremely easy to use. Just load the macro sheet called 101 into Excel and you'll have all 101 macros available for instant use at any time.

By pressing the option key, the command key and a single letter, you can insert new rows that copy data automatically. Or enter long phrases instantly. You can even toggle the gridlines and headings on and off with a single keystroke combination.

EASY TO LEARN

101 MACROS FOR EXCEL comes complete with a comprehensive, step-by-step manual that includes a short tutorial chapter and explains each of the macros and how to use them. The macros are fully documented, so they're easy to review, change and learn from — which gives you an excellent starting point for writing your own custom macros.

Circle 653 on reader service card

FREE! HANDY REFERENCE GUIDE

Act now. For a limited time you get not only a complete collection of 101 macros with User's Manual, you will also receive a handy reference guide listing all 101 macros and their call-up keystrokes.

"Outstanding . . . the ultimate macro library."
— P. Antoniak, President, Solar Systems Software

"A must-have for Excel users."
— E. Sharp, President, Clarity Glass Inc.

"A great idea . . . what a time-saver!"
— A. Stein, President, Studio Silicon

ORDER 101 MACROS FOR EXCEL today!

NOT COPY PROTECTED
60-DAY MONEY BACK GUARANTEE

CHECK YOUR LOCAL DEALER

101 MACROS FOR EXCEL

YES! I want 101 shortcuts, utilities and keystroke savers!

Send me ____ copies @ $69.95 plus $2.50 shipping ($12.50 outside U.S.A.) CA residents add $4.90 sales tax.

☐ I enclose _____

—or—

Please charge my ☐ VISA or ☐ MasterCard

Credit Card Exp. Date _____ / _____

Card # |_|_|_|_| – |_|_|_|_|

|_|_|_|_| – |_|_|_|_|

Name _____

Phone _____

Company _____

Address _____

City _____ State _____ ZIP _____

MACROPAC
INTERNATIONAL

19855 Stevens Creek Blvd., Suite 168 • Cupertino, CA 95014

1-800-624-0077
or 1-800-832-7766 (in CA)

Excel is a registered trademark of Microsoft Corp.

MacIntosh™ Software Breakthrough:

How To Ship U.P.S.™ Without Paying For The Truck.



Daytona Beach, Fla.

It all started one day around 4:30 p.m.. As I sat in my office, I could hear the rumbling of the faithful UPS truck backing up in the shipping area. I felt sorry for the driver. We had a large shipment of heavy boxes that day and the temperature was in the 90's. The driver and our fulfillment manager were in for at least an hour of filling out forms.

That's when it hit me! Here I sit in front of my Mac, there's another Mac in accounting, one in customer service, and even one at the reception desk. **But we don't have one in shipping!**

"Surely someone has figured out a way to save time and money by using a personal computer for shipping". So I picked up the phone and called United Parcel Service. I learned that there are currently 22 UPS approved computerized shipping systems available. They range in price from $5,000 to $16,000! What you end up getting is some huge, expensive system with a whole bunch of hardware and software. (And as you've probably guessed, the systems are very IBM'ish.)

Undaunted, I continued my search. My Mac had slain the IBM Goliath in accounting, production, and customer service. It could do the same in shipping!

THE ANSWER.

I didn't want to pay $16,000 for a computerized shipping system. For that much I could buy my own UPS truck! The answer came in the form of a unique program called PWI ShipMate™ by Positive Works, Inc. It is designed for both the large, frequent shipper, and also for the occasional shipper. It's priced so that even individuals can afford it. The entire price is only $295, and best of all, it was designed for the MacIntosh. It does everything that the big systems do, except that you provide the computer and the scales. It does the rest.

SAVE TIME AND MONEY

No more forms to fill out by hand. No more charts or tables to look up. No more labels to fill out. All is done automatically at the touch of the mouse. PWI Shipmate™ fills out all tags, COD, AOD, manifests, and shipping labels. Paper work that used to take hours can now be accomplished in minutes. This software literally pays for itself in a matter of weeks by saving hundreds of man hours.

In addition, this unique program compiles complete customer files with all current data. The customer filing system boasts an auto lookup function that stores and retrieves information on all frequent shipments and customers.

Not only does PWI ShipMate™ do all the paperwork, look up all the zones, and figure all of your costs, it even helps manage your business. As a special feature, PWI ShipMate™ generates timely reports. It automatically keeps track of how much you're spending per day, per month, per year, etc. In addition, it calculates a cost comparison and graphically shows you how much you would have spent if you had sent the same packages by 2nd day air, by ground transportation, etc. You instantly know how much you are spending by date, by zone, by unit, and even by shipping method.

PWI ShipMate™ is fully approved by United Parcel Service and will handle all domestic and international shipping needs.

TO ORDER

PWI ShipMate™ is available for $295 *(or $449 w/ Filemaker Plus)* from Florida Mrktg. Int'l., Inc. 142 Cone Rd. Ormond Beach, Fla. 32074. To order by credit card call 904-677-1918. You will need to have a working copy of Filemaker Plus™ to work in conjunction with PWI Shipmate™. Complete documentation, users manual, and customer support number are included with your program.

PWI Shipmate™  by *Positive Works, Inc.*

Circle 242 on reader service card

Verbatim

What do you think about some of the new non-PostScript hardware and software that will compete with *Adobe Illustrator?*

The key to competition is price/performance. If there is similar performance–that is, if the output you get from *PageMaker* (or your program of choice) is the same whether you use a LaserWriter or a GCC Personal Laser Printer–then you'll buy the cheaper printer.

I don't think that Apple's old customers (back when GCC's HyperDrive was the only hard disk) were brand-name shoppers. But now that Apple is selling to big companies, maybe the six-color logo on the box will mean something.

Why are there so few women professionals in this industry?

I don't know. I haven't found many barriers because I'm a woman. Most of the developers are glad to see a woman here.

Is it a problem or an advantage?

Both. A lot of this business is predicated upon personal relationships. Being a woman helps and hurts. Some people tend to remember me more than they might otherwise because I'm a woman. When it hurts, I have to pull out my Stanford MBA credentials to get my foot in the door.

What do you consider the burning issues in the market now?

For us there is the issue of whether or not a company our size can survive, or do we have to be big to stay in the market? Look at Living Videotext, Forethought, and other companies with a high profile in the Macintosh market that have been swallowed up.

We don't want to be acquired. We enjoy what we do here. So it would be great if it could go on as it has been. I have the best of jobs–a small group of the best people, lots of profit, different projects to work on. But if the industry changes too much, that may not be possible. There is a consolidation of our industry at present, and almost a consolidation of customers as well.

We're always evaluating our options. If remaining small becomes impossible or if the industry changes further, then we'll gladly pursue relationships with larger companies. We have products and talents that I'm sure could certainly benefit some of them. □

Interviewed by Jerry Borrell



MacTilt SE®

The Mac SE sitting on the desk leaves the screen too low for comfortable operation. MacTilt SE elevates the Mac 4″ and provides 30° tilt and 360° rotation for better viewing and greater operator comfort. **$89.95**



The Muzzle™

The Muzzle protects your confidential files, documents, and other sensitive data. A locking bracket effectively prevents the Mac SE from being powered up, eliminating access to any data on the hard disk. The entire Muzzle can also be secured to a desk or workstation with a cable or chain to physically secure the Mac in place. **Muzzle $49.95**

MacTilt SE/Muzzle $129.95



Pedestal Base™
for Large Screen Display

The same outstanding features and user benefits of the MacTilt are now available for your Large Screen Display, Commercial CRT, Personal or Portable Computer, or Graphics Monitor. Enjoy a better viewing angle and reduced eye, neck, and back strain. Call for specific models. **$89.95-$99.95**



Mac II Workstation™

Everyone who needs the power of the Mac II also needs the space that the Monitor and Processor occupy. If there is no desk space to organize work and lay out projects, the Mac II's effectiveness is limited. The new Mac II Workstation takes a totally new approach to workstation ergonomics. This free standing workstation sits alongside your desk and provides a unique arm suspension system and shelf area giving the operator the ultimate in adjustability and space savings. **$499.95**

ERGOTRON® ACCESSORIES

Call your Dealer or Distributor

or

ERGOTRON inc

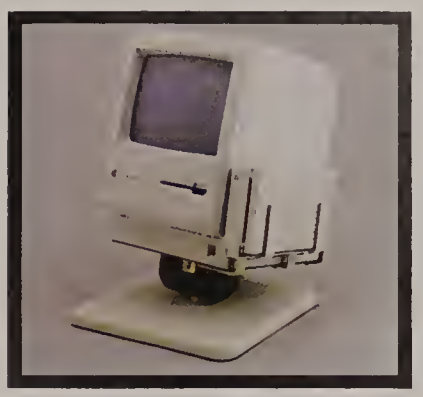
1621 E. 79th Street • Minneapolis, MN 55420

(612) 854-9116 • 800-328-9839



MacBuffer LW™

MacBuffer LW increases office productivity by eliminating the need to wait for the LaserWriter. This means that every operator on the network can send MacBuffer LW their print jobs and get back to work. MacBuffer LW can handle unlimited Macs and LaserWriters, provides for full queue management, and is totally transparent to operators. Available in 1,2,3, and 4 Meg models. Call for pricing.



MacTilt®

With a silky-smooth, one hand motion, your Macintosh can be adjusted to relieve operator stress, ease neck, back, and eye strain, and increase productivity. The MacTilt elevates the Mac 4″, and provides 30° tilt and 360° rotation at the touch of a finger. **$89.95**



Mouse Cleaner 360°™

By regularly cleaning your Mouse, you can eliminate sluggish operation and expensive repair bills. By removing the grime from the tracking rollers, free cursor movement is quickly restored. Compatible with IBM, Apple, Atari, Amiga, Microsoft Mouse, and others. **$16.95**



MacBuffer™

If you are an Imagewriter user, MacBuffer will automatically reduce the time the Macintosh spends waiting for the printer. In addition to less time spent waiting, MacBuffer enables two Macs to share one printer and has Local Copy and Single Sheet Mode. Get the most out of your Imagewriter I or II with MacBuffer. Call for pricing.

— Premium Quality Gifts In Every Price Range —

Circle 676 on reader service card

For those who use Apple® Computer:

High performance, superb technology, excellent pricing and the best service from the leader in price-performance technology.....



$320

Reach out and touch the world

- For your Apple Macintosh™
- A 300/1200/2400 Baud external modem
- Bell 103/212A/CCITT V.22/CCITT V.22BIS compatible
- Works with Smartcom™II and hundreds of other programs like Macterminal™, Applelink™ and Red Ryder.
- Fully Hayes compatible
- Works with Macintosh™SE, Macintosh Plus, Apple II, IBM®PC/XT/AT™, and PS/2™machines.
- Easy to use and install. Full instructions.
- Documentation and built-in diagnostics included.



MAC™ File Server

For Apple Macintosh™ Network Systems For Tops™, Appleshare™ and Macserve™

Now, for your office automation the FS-100. The FS-100 is a fileserver which comes with a hard disk (261MB) and a 45- 60MB tape backup built into it. It is the latest in disk technology combined with the industry standard SCSI interface which offers optimism performance for your total network! The FS-100 is excellent if you use Tops™, Appleshare™ and Macserve™.

Features:

- Built-in 45-60MB tape backup with 90KB/Sec transfer rate
- Built-in 261MB hard disk with 23ms access time
- Weighs 86.1 lbs./39kg
- Dimensions 22"x10"x24" fits under a desk!
- SCSI interface
- Perfect for networks like Tops™, Appleshare™ and Macserve™.

$9,999 For 260MB System

$13,995 For 485MB System



Made in U.S.A.

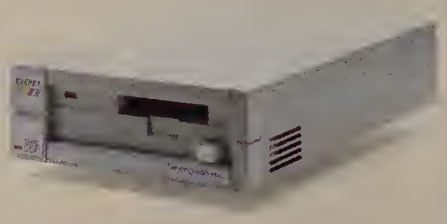
Hard Disks for the MAC™

These high quality hard disks range from 20MB to 90MB. They come with a built-in SCSI intelligent controller and can transfer upto 1.5MB per second and are either MFM or RLL.

Features:

- 5.5"x7"x15.5" portable
- SCSI built-in interface
- MFM/RLL recording method
- 65ms or 40ms
- Built-in power supply
- Disk utility and software included

Price:	External	Internal
20MB 65ms	$649	$445
40MB 40ms	$949	$899
91MB 18ms	$1495	$1395



Tape Backup Subsystems

Now you can afford to conveniently back up your hard disk or floppy data on a cassette and eliminate the horror of accidental data loss due to hard disk crashes. You can backup in image, or file by file mode. Whats more is that the subsystem is portable!

Features:

- Can be shared by several computers (cable included)
- 60MB high capacity on a single cassette (included)
- 9 track serpentine QIC-24 format / • Read-after-write verify
- Automatic retries on error / • Mirror image/file-by-file backup

$950 for 60MB External

Others

Cable 25-50	$40
Cable 50-50	$40
Teminator	$40
60MB Cassette	$30

(415) 490-2201

Dealers and Quantity Discounts are available, University P.O.'s are welcome

ORDER BY MAIL: Check and Money Order, California add 7% Sales Tax.
ORDER BY PHONE: COD, Cashier Check, VISA (3%), MasterCard (3%), American Express (4%), or Approved Company P.O.'s.
Policy and Terms: All prices are subject to changes and quantities maybe limited and we reserve the right to substitute equivalent items. Unauthorized returns are subject to a 15% restocking fee. RMA numbers must be attached to all returned items and must be sent shipping prepaid by customer. The limited warranty is 1 year on parts and 6 months on labor.

CLUB

American Technologies, Inc.

Mac Division

3401 W. Warren Ave., Fremont, CA 94539

Apple Macintosh, Macintosh SE, Macintosh Plus, Apple II, Appleshare, Macserve, Macterminal, Applelink, Smartcom II, Red Ryder, Hayes, Tops, IBM PC/XT/AT, and PS/2 are trademarks or registered trademarks of their respective companies.

Circle 593 on reader service card

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

SUBSCRIBE & SAVE ALMOST 50%

The Future is Here!

YES The time is now to move into the future! Send me 12 issues of *Macworld* for only $24.00. I'll save $23.40 off the annual cover price of $47.40, a savings of nearly 50%.

SAVE EVEN MORE!

☐ $37.90 for 2 years (24 monthly issues)

☐ Payment enclosed ☐ Bill me later

Name (Please print your full name)

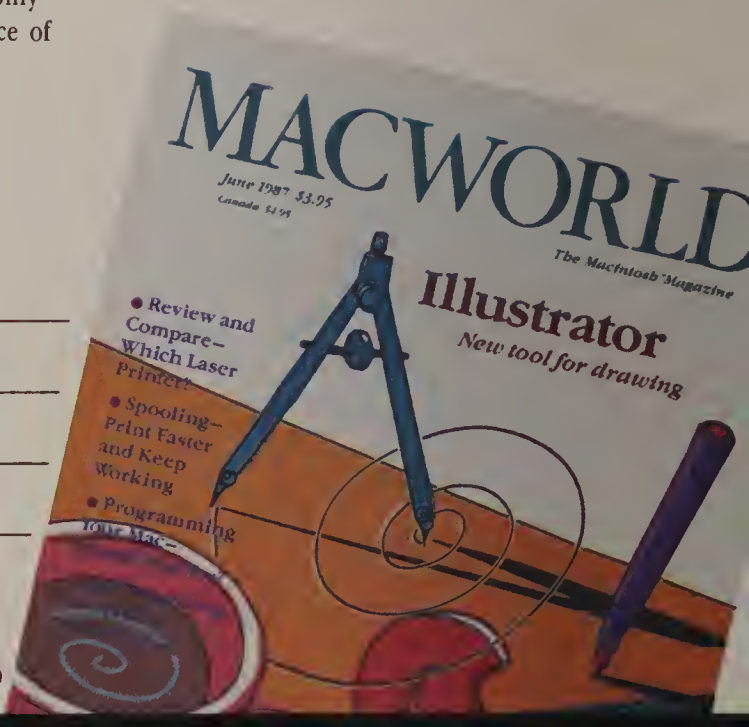
Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. By regular subscription Macworld is $30 for 12 issues.

4BQB0



Macworld News

by Gil Davis

MAX AGUILERA-HELLWEG



Hear ye, hear ye. All rise. Here comes the judge. He's Harry Anderson of NBC's "Night Court," whose somewhat zany–and Macintosh-infused–private life is a lot like his loony character's.

Night Court

Harry Anderson, better known as Judge Harry T. Stone of NBC's "Night Court," is also a magician and sometime Macintosh evangelist. Anderson has done magic tricks and street performing in North Hollywood since he was 16, and his exploits with computers also go back several years. He bought a VIC-20 on impulse, then a Commodore 64 and an Apple IIe. Next Anderson bought a Macintosh, and he's been a diehard Mac user ever since. He currently has 14 Macs, including a Dynamac and an SE, which he uses to keep his various projects and enterprises up and running. Livestock Productions, Anderson's production company, named for the magician's trick of pulling a rabbit out of a hat, and Anderson's Illusions, a magic and special-effects division (which turned a can of 7-Up into a basketball in a commercial with Magic Johnson), keep the stable of Macs in use.

Anderson even has a Mac in his trailer on the "Night Court" set, equipped with a modem so that he can communicate with his office. He uses the Mac to write and storyboard episodes of "Night Court," specials for NBC TV and HBO, and a book entitled *Games You Can't Lose and Bets You Can't Win* for Simon & Schuster.

Anderson's evangelism for the Mac carries over to other members of the "Night Court" team. He has convinced several of the actors and crew to buy Macs. And if you look closely as the camera pans Judge Stone's office, you'll see a Dynamac perched on a desk. The on-screen and off-screen characters share the same passion.

Beyond the Mouse

The mouse was once hailed as a revolutionary input device. Nevertheless, it still represents an imperfect liaison between the Mac's screen and the most intuitive input device of all: the hand. Three companies have recently demonstrated devices that provide a more direct means of manipulating information on screen.

Perhaps the most direct approach comes from MicroTouch Systems' Mac & Touch Screen, which enables you to use your finger to choose menu items, click on-screen buttons, and select and drag objects on a Mac Plus, an SE, or a Mac II.

Before this can work, a sheet of glass with a resistive coating must be placed over the Mac's screen. The touch-sensitive sheet controller senses the position of a conductive object–such as a finger–and records the position on a grid of 1024 by 1024 touch points.

In addition to offering a more natural interface than the mouse, a touch screen takes up no desk space, making it more convenient for public demonstrations where a mouse might be damaged or stolen.

A touch-sensitive screen is fine for dragging objects and pressing buttons on a flat surface, but imagine plunging your hand into the Mac's screen and moving objects in 3-D space.

The DataGlove Model 2 from VPL Research introduces a re-

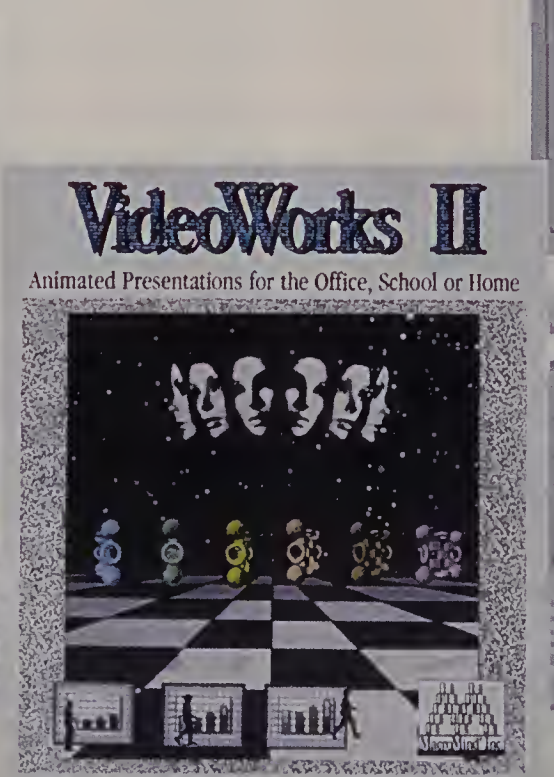
(continues)

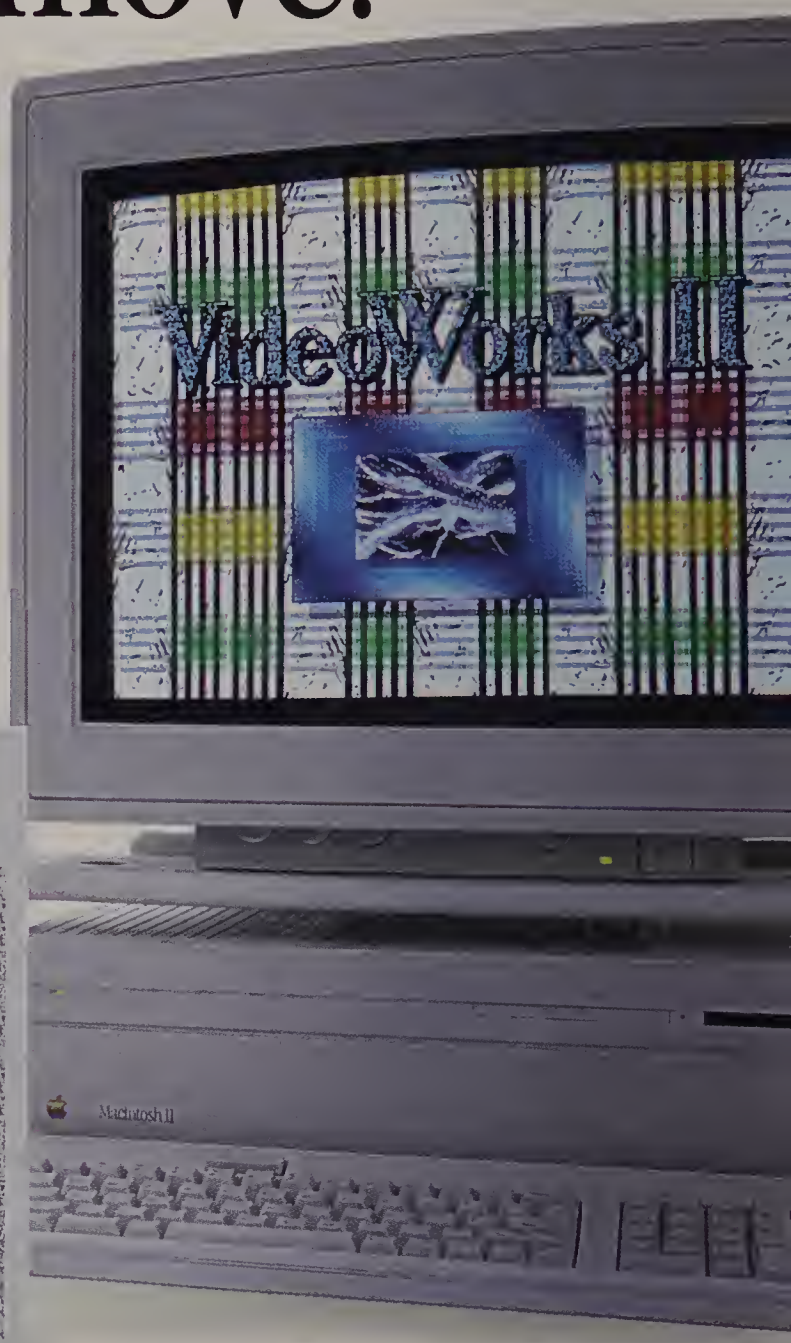
It's one thing to have great graphics. It's something else to make them move.

VideoWorks™ II for:

- Business Presentations
- Animated Slide Shows
- Multi-media Storyboards
- Educational Movies
- Entertaining Animations
- Suggested Retail Price $195







MacroMind has been making the Macintosh look great for years. Now let us make you look great with VideoWorks™ II! The Overview window creates slide shows that can include animation, wipes, fades, timers or sound. VideoWorks™ II works great with the Macintosh II (in either 16 or 256 colors) or the Macintosh 512, Plus, SE.

Create animation on your Macintosh with VideoWorks™ II. Take any artwork you have and create animated presentations, storyboards, educational courseware, point of sale displays or music-videos. From MacroMind® Inc., the creators of MusicWorks™, M.U.D.™, Art Grabber™, ComicWorks™, GraphicWorks™, Maze Wars+™.

Original VideoWorks owners can upgrade to VideoWorks II for $100. Send your check, VISA or MC order along with your VideoWorks Movies disk.

VideoWorks II

VideoWorks™ II © 1987 MacroMind™ Inc., 1028 W. Wolfram St., Chicago, IL 60657 (312) 871-0987. Comes with three disks: Program & Tutorials, Clip Amimation, Artwork & Movies and a Guided Tour training disk. Not copy protected. Distributed by Brøderbund Software. Ask your local dealer.

MacroMind® Inc.

Circle 781 on reader service card

markable user interface for simulating motion in three dimensions. The DataGlove is just that–a glove that senses hand gestures and transmits them to an image on the Mac's screen.

The glove is connected to a control unit that contains a position-and-orientation system, which records hand and finger movements. When you wear the glove and move your hand, a representation of a hand appears on the screen, duplicating your movements in real time.

The DataGlove can be used in areas such as human-factors engineering (the science of interfacing humans and machines) and telerobotics. It has already been used in conjunction with 3-D animation software from SimGraphics Engineering to simulate the movements of astronauts and equipment in a proposed space shuttle module. The DataGlove Model 2, which operates with the Mac Plus, sells for $8200–a small price to pay for this type of simulation in the microcomputer world.

Another unusual interface comes from Anatex. *Personal Writer 15* is a handwriting recognition system that translates written letters into typed text on the Mac's screen. The system works with word processors, graphics packages, spreadsheets, and page-layout programs.

Personal Writer comes with a digitizing tablet, a pen, and software that "learns" your handwriting. Numerous handwriting files can be saved, allowing more than one person to use the interface. As you write a word or phrase on paper, the text appears on the screen.

Two versions of the system are available: *PW 15 S* requires you to print letters in a grid format; the more flexible *PW 15 SL* doesn't restrict you to the grid. In addition, *PW 15 SL* not only reads your handwriting, but corrects your spelling with a 100,000-word dictionary. *PW 15 S* sells for $895, and *PW 15 SL* for $1395.

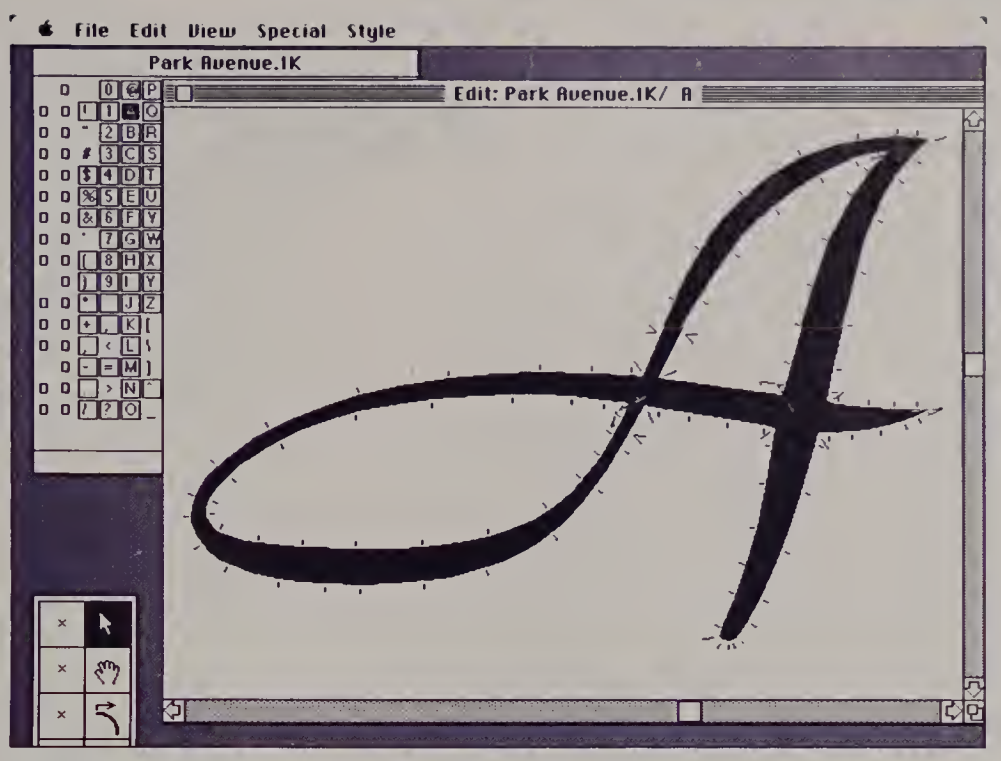
To some, returning to handwriting might seem a step backward; but to others, drawing and writing with a pen instead of rolling a mouse and pecking at a keyboard might be the natural way to compute.

For more information, call MicroTouch Systems in Woburn, Massachusetts, at 617/935-0080; VPL Research in Redwood City, California, at 415/361-1710; and Anatex in Los Angeles at 213/556-0151.
–Erfert Nielson

DAN ESCOBAR



The DataGlove hand can rotate a 3-D Mac image through three dimensions. More practical uses include remote-control handling of hazardous materials.



Designing an alphabet on* MacIkarus *is a matter of pushing and pulling on "handles" located on the font's outline.

Count 'Em, 1563 Fonts

Everyone familiar with desktop publishing is aware of the importance of fonts. But to some people, fonts are of particular interest. Graphic artists may have demanding clients who need a specialized font for their company's logo, or a publisher may want to use fonts to give a publication a particular "feel."

Up to now, most font-design systems have cost $100,000 or more, which is why there are currently only 40 Ikarus font-design systems in the world. So it didn't go unnoticed when Ikarus software modules were displayed on a Mac II at the Seybold Desktop Publishing Conference in September.

According to The Company of Boston, which represents the developer, URW of Germany, *MacIkarus* is a trial balloon to see if people want a Mac II font-design system that has a worldwide reputation and 1563 associated fonts–which is probably two to three times the number available from most other suppliers.

Font design begins with the display of a single character, which is then modified to suit the designer. Key parts of the resulting character–such as serifs, points, and accents–are automatically stored and carried over to the rest of the alphabet.

You can modify individual characters with the Ikarus editing system by placing points on the font's outline that can be dragged to new positions to create a new curve. The basic alphabet can then be expanded, condensed, italicized, changed in horizontal proportions, or given an outline and shading.

In addition, General Computer recently introduced Fonts

(continues)

OVER 15,000 DESKTOP PUBLISHERS MADE MICROTEK #1.

More sophisticated desktop publishers are using Microtek desktop scanners with their IBM-PCs and Macintoshs than any other. This was true in 1985, 1986, and is still true in 1987! Several independent surveys have verified this.* Over 15,000 have chosen Microtek manufactured scanners.

Why do more people choose Microtek? One reason is Microtek's product "family." You can choose from four different image scanners; plus Optical Character Readers; plus Fax communication tools; plus Raster to Vector conversion software.

*International Data Corp. and Dataquest reports.

Macintosh is a registered trademark of Apple Computers, Inc.
IBM is a registered trademark of International Business Machines Corporation.



Our family gives you room to grow with the confidence that all members will work together.

Another reason why over 15,000 desktop publishers have made us #1 is that Microtek products are more reliable, and more feature-rich than others. You can count on receiving more capability for your money with Microtek. We are the choice of the serious user! Contact your local Microtek Dealer or call us to see why.

MICROTEK

16901 South Western Ave.
Gardena, California 90247
213-321-2121 800-654-4160

Circle 714 on reader service car

Plus–16 additional fonts for its 300-dpi Personal LaserPrinter, which uses QuickDraw as a page-description language (an AppleTalk connection is in the works). Fonts Plus lists for $299 and includes two additional headline fonts, Futura Extra Black and Cooper Black, plus five other fonts, ITC Avant Garde, ITC Bookman, Century Schoolbook, ITC Zapf Chancery, and ITC Zapf Dingbats.

Adobe Systems has also announced six new typeface packages, bringing its Adobe Type Library to 147 individual fonts. The average price per package is $185.

CasadyWare's most popular font is now Calligraphy, which is compatible with PostScript. For $69.95 (list), you receive Regency Script and Calligraphy Laser in 14-, 18-, 24-, and 36-point sizes, plus tips about how to install and use the extra fonts. For more information, call The Company in Boston at 617/439-5346; General Computer in Cambridge, Massachusetts, at 617/492-5500; Adobe in Palo Alto, California, at 415/852-0271; and CasadyWare in Carmel, California, at 408/646-4660.

Speeding Up Your SE

Accelerator boards are typically used in image and signal processing, high-resolution displays, 3-D solid-color graphics, artificial intelligence, and large relational databases.

Up to now, adding an accelerator board to your Macintosh SE cost $995 to $1899. But now you can speed up your SE using MacMemory's $599 Turbo SE. Although it uses basically the same 68000 processor normally found in the Mac SE, it runs at twice the speed–essentially doubling the SE's performance.

MARK JOHANN



Turbo SE doubles an SE's speed, giving users a taste of high performance. Add a math coprocessor for fast calculations.

For $399, you can obtain even more speed. According to MacMemory, plugging a Motorola 68881 math coprocessor chip into the Turbo SE board allows programs that use the 68881–such as *Microsoft Excel*–to run up to five times faster during calculations. Pure math computations have reportedly been clocked at 60 times previous speeds.

Levco's $395 CacheCard and the Turbo SE function similarly, except that CacheCard also includes a 16K RAM cache that feeds the most frequently used instructions and data directly to the 16-MHz processor rather than to the much slower processor on the SE's system board.

At the high end of the accelerator-board market is Levco's TransLink parallel processing system, which puts the power of the VAX 8600 mainframe into the SE or the Mac II. The heart of the TransLink system is the INMOS Transputer–a high-speed, 32-bit parallel processor with a throughput of 10 million instructions per second (MIPS), in comparison with the 2.5 MIPS of the standard Macintosh II. Multiple Transputers can be plugged in to create a supercomputer throughput of 200 to 300 MIPS, according to Levco.

A TransLink starter kit retails for $2499 for the Mac II and $1899 for the SE, and includes a software tool kit. Additional Transputer modules cost from $1299 to $3499, depending on the module's clock speed; memory; and optional on-chip, floating-point math coprocessor.

For more information, call MacMemory in San Jose, California, at 408/922-0140; INMOS Corporation in Colorado Springs, Colorado, at 303/630-4000; or Levco in San Diego, California, at 619/457-2011.

Shhh, Don't Tell the Competition

Harvey Andres has kept his secret weapon secret about as long as he can. Now the word's getting around to the competition that he's using a Mac to win contracts in an unusual way.

Andres–of Andres and Associates in Bethel Island, California–bought a 512KE two years ago to create client mailing lists. Soon after, he began experimenting with *MacPaint*.

Before long he realized he could use the program to design food- and beverage-industry processing plants. With *MacPaint* Andres could easily depict conveyor belts, bottling machines, and their enclosures, and then print the results on an ImageWriter.

It was a good idea that got better when Andres began taking his Mac along when he visited clients. "We need three more feet between the conveyor and that wall," a client might say. Andres would turn to his Mac and make the change within seconds, satisfying his clients because their plants were designed "their way."

Andres calls his secret *client-aided design*. But it's not a secret anymore.

DAN ESCOBAR



Harvey Andres wasn't shy about his new Mac, so he took it along when visiting clients. Everything went fine till one crusty worker shouted, "Are we buying a conveyor line or a computer?"

National Semiconductor

We were ready for the Mac II almost before they were.



INTRODUCING THE NS8/16 MEMORY EXPANSION BOARD FOR THE MACINTOSH II

National has been providing high-level add-in products for over a decade. We've helped well over a hundred thousand multi-tasking, multi-user business environments run faster and better. So even before Apple was ready with the new Mac™ II, we were ready with the expertise and technology to help it work harder.

In fact, we viewed the Macintosh™ II as an 'open' invitation to provide power users with the right tools. And now we're proud to introduce the NS8/16 Memory Expansion Board.

GET 4, 8, 12, OR 16 MBYTES OF RAM FEATURING:

- Apple/UNIX® (A/UX) compatibility.
- RAMdisk software.
- Advanced NuBus™ support.

Speed through memory hungry applications like: CAD/CAM. Desktop Publishing. High Resolution Graphics. Big Databases and Spreadsheets. Financial/Accounting packages. And AI Programming. Just to name a few.

AND RUN A/UX MORE EFFICIENTLY

High-end applications will run at top performance levels under A/UX. Without modifications. And the NS8/16 remains completely transparent to the user.

In the Macintosh II operating system, the RAMdisk utility allows an application to treat the NS8/16 as one, or a series, of pseudo disk drives, accessing files at NuBus memory speeds.

So memory intensive applications will go much faster. As will switching between applications.

ALL WITH QUALITY AND SUPPORT YOU CAN RELY ON

Get a full 5-year warranty on the NS8/16. Backed by the leader in memory products. And customer service.

National is the company you should think of for add-in products. Now, with our NS8/16 Memory Expansion Board. And in the future — you can expect to see a whole line of add-in products for the Mac II.

It's experience that lets us make a promise like that. So now that you have the Mac II ready to run, you know who can help you see how far it can go.

FOR MORE INFORMATION CALL THE COMPATIBLE PRODUCTS GROUP AT 800-345-4006 OUTSIDE OF CALIFORNIA CALL 800-538-8510

National Semiconductor

Macintosh and Mac are trademarks of Apple Computer, Inc.
UNIX is a registered trademark of AT&T Bell Labs.
NuBus is a trademark of Texas Instruments Incorporated.
© 1987 National Semiconductor Corp.

Circle 196 on reader service card

Mac with Teeth

With the versatility of the Macintosh computer, good software is sometimes used for applications not dreamed of by its developers. *ToothPics* was developed by Class One Limited in Tempe, Arizona, to provide dentists with an easy way to enter their patients' information and run their practices.

ToothPics pioneered the on-screen dental chart in which a dental assistant uses the mouse to select teeth and procedures. Older systems required that all



The Macintosh helped forensic experts identify airline crash victims quickly.

entries be typed, a mistake-prone and time-consuming process.

Dr. Steven Smith, chair of Northwestern University's forensic dental section, saw a new application for *ToothPics*. Upon his request, Class One donated to the university a modified version of the program that allowed charting information to be transferred as a text file. Standard database programs could then be used to match existing dental records with human remains.

When a major airline crash occurred in Detroit, Dr. Allan Warnick, chief forensics Odontologist of Wayne County, Michigan; asked Dr. Smith and his colleague Dr. Larry Pierce to set up and run forensic computers at the crash site. Apple immediately airlifted in two Mac IIs. The Mac IIs and several locally donated Macs were networked in the forensics hangar. The Macintosh lived up to its reputation for ease of use: volunteers were trained and charting dental records within an hour of arriving.

With the aid of *ToothPics'* charts and a list of most probable matches (generated on *4th Dimension* by database expert Forrest Lorz of Maryland), the forensics specialists began to identify the victims.

One FBI expert, upon seeing the devastation of the crash, had estimated that it would take three weeks before all the remains could be returned to the families. But in this case, the forensic team completed the crash site identifications within six days of the accident–129 of the 156 victims were identified by dental records.

"This is the first time that computer dental graphics have been applied to assist forensics in a large-scale disaster," said Class One president Bert Cutler. "We are pleased that our dental office product could be adapted and used in such a high-pressure environment.

"Forensics is not an area that one would normally associate with business software, and it has been gratifying to be able to serve these families."

Seeing Sounds

Using a Mac, it's now possible to *hear* a room even before it's built–a real advantage for acoustical engineers who might be called on to design anything from a home entertainment center to a concert hall.

Using a new program called *Modeler,* a sound engineer can convert drawings of a room's shape and information about its building materials into a model of its acoustical properties. The engineer can then alter this model to achieve a representation of the desired acoustical environment.



BRIAN BRAINERD

Tom Birkle conducts a nonexistent orchestra. No sound source is necessary because his acoustic simulation program needs only a Mac.

First *Modeler* enables the engineer to situate up to 100 groups of electronic speakers on the plans using a click-drag procedure. Speakers are positioned using three-dimensional coordinates.

Modeler then calculates direct-field, reflected, or direct-plus-reflected sound prior to producing a presentation-quality graph that superimposes a sound-pressure-level map on the floor plan. Modifications can be made to speakers, room dimensions, and materials to "tune" the room for the desired sound.

"*Modeler* makes an excellent sales tool because clients get involved in designing their own sound systems, using easily understandable graphs," says Tom Birkle of David L. Adams Associates in Denver, Colorado. Birkle codeveloped the acoustical simulation program with Bose Corporation, which licenses it to more than 200 commercial sound contractors and design firms worldwide.

Modeler works on everything from a 512K to a Mac II, where it runs about five times faster than it does on a Plus because of the Mac II's math coprocessor. For more information, call Bose in Framingham, Massachusetts, at 617/879-7330. *–Craig O'Donnell*

Big Screens, New Choices

Five new entries into the black-and-white large-screen market bring Mac enthusiasts new capabilities.

Perhaps the most dramatic of these new offerings also has the smallest screen: 17 inches, versus 19 inches for the other four. But what E-Machines' The Big Picture IQ lacks in size, it makes up in image quality by bringing the Mac II 256 levels of gray, compared with the one level of gray displayed on a Macintosh Plus or SE. High-quality photographs can now be scanned, displayed on the screen, modified electronically, and then pasted into page

(continues)



Quick. Pick the workstation.

It's the Macintosh™ II with the big, high-resolution, high-performance 19″ display.

Available only from SuperMac Technology.

Graphics *power* that turns a great *computer* into a great *workstation*. The result: The ultimate system for running Mac software. Because it is, simply, the ultimate Mac.

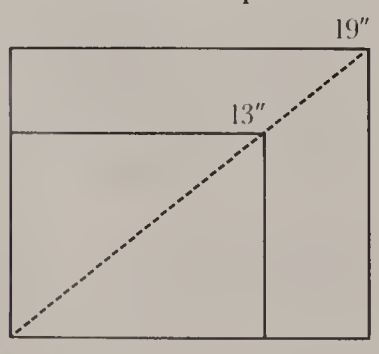
How to create the Macintosh workstation:

Just install one of our workstation video boards in any Mac II slot.

Then connect your monitor. Turn on the power, and you're *running*. No special software. No jumpers.

For color, our *Spectrum*™ system brings you 1024 x 768 resolution with up to 256 glorious colors at once, from a palette of over 16 million. Or 8-bit gray scale, if you wish.

For monochrome, you get even greater resolution of up to 1365 x 1024 pixels with our low-cost *Graphix*™ system. That means that Macintosh can display a two-page spread with room to spare. *And* you can still read the fine print!



Spectrum offers double the visual area of Apple's color display. So you see much, much more of your work.

Because SuperMac video boards are programmable, you can even start small and upgrade later. Choose from Apple's 640 x 480 monitor, or choose an 800 x 600 multisync-type monitor for 50% more resolution. Or for the ultimate workstation, choose SuperMac's 1024 x 768 19″ workstation monitor.

See SuperMac video before you commit to *any* video for your Macintosh II.

Only SuperMac video gives you highest resolution.

Only SuperMac video gives you your choice of monitors, up to 19 inches.

Only SuperMac video runs all the standard Macintosh software *and* A/UX, Apple's implementation of the UNIX operating system.

(And for specialized broadcast applications, we've even included genlockable NTSC output.)

See SuperMac video at your nearest SuperMac video dealer. And see the difference between a great computer and a great *workstation*.

SUPERMAC TECHNOLOGY

295 N. Bernardo, Mountain View, CA 94043, (415) 964-8884

Trademarks: Macintosh: Apple Computer Inc. Image by Markus Houy using *Dimensions*.

makeup applications for magazine-quality results. The Big Picture IQ lists for $2895 and offers 1024- by 808-pixel resolution.

Although the LaserView from Sigma Designs offers only four levels of gray, with 1664-by-1200 resolution, it's capable of emulating workstation performance—resulting in 11 times the number of pixels displayed on a Mac SE screen. The LaserView lists for $2395 for the Mac II and $2295 for the SE.



Another ultra-high-resolution display is the Vista 1600 from Cornerstone Technology, which features 1600-by-1280 resolution and costs $2195. Also listing for $2195 is the Viking 1 by Moniterm, which is plug compatible with the Mac II and the SE (and with IBM's PC, XT, and AT) and features 1280-by-960 resolution.

Looking a lot like the Vista 1600 is Radius's $2395 Two Page Display (TPD). But don't be fooled, Radius only borrowed the bezel around the front edge—the insides are completely different. The TPD offers 1152-by-864 resolution and simultaneous use of the SE's screen—a feature Radius introduced a year ago with its Full Page Display.

The TPD also has a number of unique features built into the hardware: tear-off menus for all programs, a magnifier, an enlarged menu bar, and the ability to bridge the two screens so the cursor flows from the TPD to the Mac screen without interruption.

For further information, call E-Machines in Tualatin, Oregon, at 503/692-6656; Sigma Designs in Fremont, California, at 415/770-0100; Cornerstone Technology in San Jose, California, at 408/433-1600; Moniterm in Minnetonka, Minnesota, at 612/935-4151; and Radius in San Jose at 408/434-1010.

The Profits Motive

Button Down Software's *Profits* promises to be a program that will sell Macs to a group previously thought to be thoroughly entrenched in the MS-DOS environment. *Profits* will appeal to stockbrokers and active traders because it offers technical tools that have not previously been available on any personal computer.

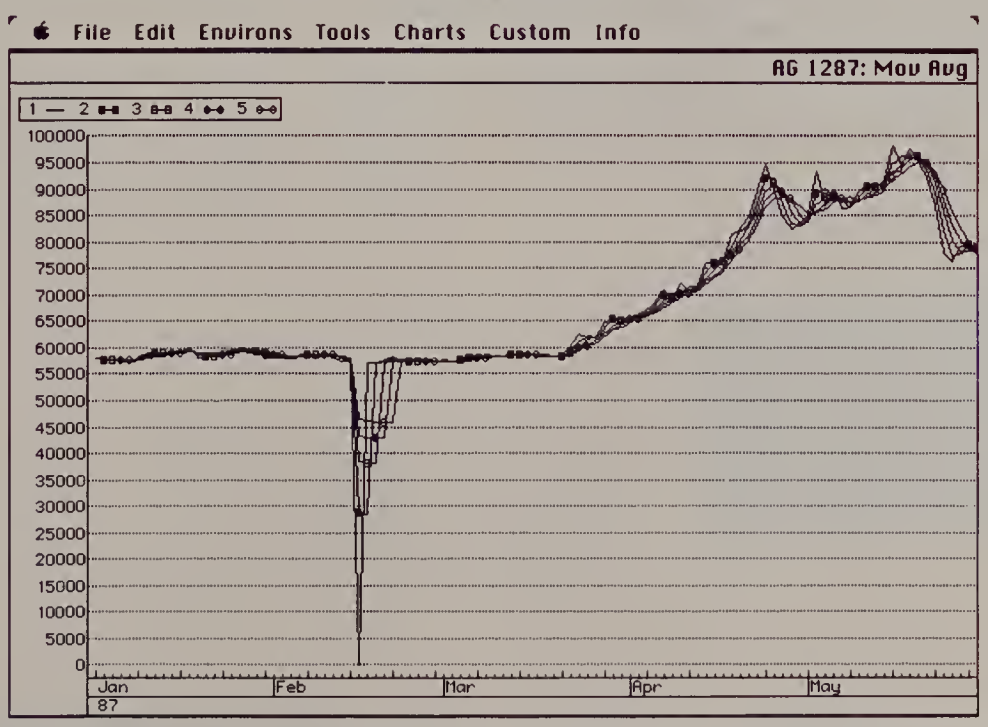
Profits instantly creates charts that can be customized in a way that's both innovative and consistent with the Mac interface. It even coins a few new terms in the process; *chart suites* is one. Chart suites preset the program to open as many as six prespecified types of charts at once, or the same type of chart for six different stocks, commodities, mutual funds, or indexes.

Quotes can be downloaded from Dial/Data or CompuServe directly into specified charts and printed in a number of ways. The charts are enlarged when printed in order to take advantage of paper size; one or more charts can also be printed on a single page.

Profits allows you to set alarms, so that a bullet will automatically be placed on your charts to alert you to whatever activities you specify.

The Mac II brings out the full potential of this program, with its larger screen size and its customizable color environment that can better distinguish between different trend lines on the same chart.

Although the package does include some basic information about technical analysis, it's really designed for the serious trader—if only because of its price. But with a staggering number of customizable charts, as well as the refined trend and momentum indicators available for the first time to personal computer users, the $495 price could be money well spent for a portfolio manager in need of technical tools.—*Linda Joan Kaplan*



No, this isn't a chart of Black Monday's stock crash—but it could have been. Serious technical traders predict the future using* Profits' *charts.



JOYCE RAVID

Because John Farago looked ahead, students can now plug into a network easily.

Mac Law School

Five years ago, when John Farago and two others founded the City University of New York (CUNY) Law School at Queens College to specialize in teaching public interest law, they knew computer access was going to be important to faculty and students alike. So Farago insisted that the campus's one building be wired as if data were a utility—just like electricity—with computer-network-access outlets throughout.

Last summer, the school's computer system was rebuilt from scratch. Now there are 150 Macintoshes, 27 LaserWriters, 70 DEC Rainbows, and 3 DEC MicroVAX II computers ready to accommodate about 450 students and 150 faculty and staff members.

All these computers are attached to the CUNY computer network, an Ethernet backbone connecting 16 AppleTalk networks (configured with Farallon's PhoneNet and accessed with Kinetics' FastPath) to the MicroVAX systems. With Pacer's

(continues)

QUICKEYS™

The keyboard enhancer for your Macintosh

"QuicKeys is the sort of outstanding product that you recognize instantly as a Mac classic; an essential product for every Mac in your office."
Bob Perez, Business Evangelist, Apple Computer, Inc.

For: Mac 512E, Plus, SE, and II.
QuicKeys gives your extended keyboard something to do. Works with standard keyboards, too. "QuicKeys brings new life to old and new keyboards."
-Neil Shapiro, Editor-At-Large, MacUser,
Chief Sysop: MAUG

How fast can you learn to use QuicKeys?
How fast did you read this sentence?

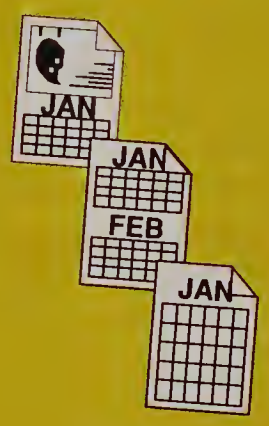
Define up to 100 universal QuicKeys (to use anytime), plus up to 100 QuicKeys for each and every program you use!
Just $99.95

Assign keys for all sorts of commonly used commands: opening programs, repetitive text, selecting typefaces, opening desk accessories and more. Your are unlimited in what QuicKeys can do for you. It's so easy to use, you'll want to use it with everything.

CalendarMaker™

Presentation quality calendars.

"If you use calendars, you need CalendarMaker"
- Nibble Mac, October 1987



"Every year I have the same problem: finding the ideal calendar...
In answer to this universal dilemma CE Software has published CalendarMaker."
MacWorld, March 1987

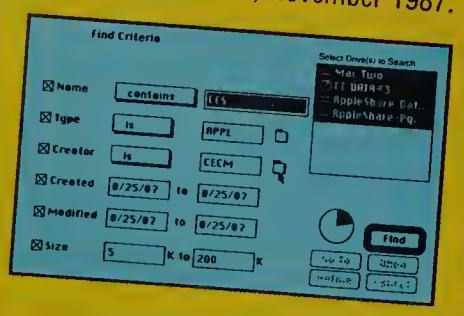
4-1/2 Mouse rating. MacUser, December 1986

Enter events manually or import from programs including: MORE!™, SideKick™, BatteryPak™, SmartAlarms™. Export calendars to MacWrite, MacPaint, MacDraw, PageMaker and others.. Just $49.95

DiskTop™

A portable finder.

"DiskTop may well be the best desk accessory I've ever owned; I use it more than any other....this may be the best value in Macintosh software today."
Max Vizla, The MACazine, November 1987.



4-1/2 Mouse rating-MacUser, August 1987.

With DiskTop you can find, copy, move, rename, create folders, and more without ever leaving the document you're working in.

DiskTop contains the most powerful yet easy to use "Find" command available on the Macintosh. Hard drive users love it. Just $49.95

CESOFTWARE

Visit your retailer or call (800) 523-7683 for VISA or MasterCard Orders.
To purchase by mail send VISA or MasterCard with expiration date, check or money order with appropriate amount plus $2.00 shipping and handling for each product ordered to CE Software, 801-73rd Street, Des Moines, Iowa 50312.
For information call (515) 224-1995

CalendarMaker, DiskTop and QuicKeys are trademarks of CE Software.
Other names indicated by ™ or ® are trademarks of their respective manufacturers.

Circle 604 on reader service card

PCLink, students access DEC's E-mail program, *VAXmail,* to send messages to faculty members. They can also transfer files between the Mac and VAX systems.

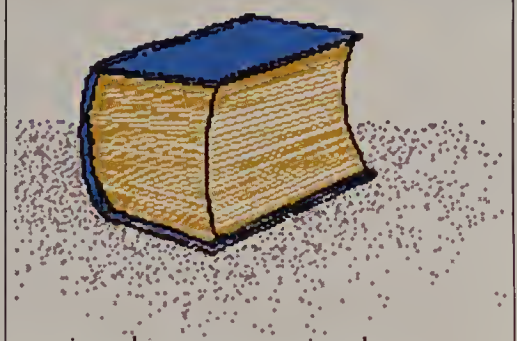
In addition to accessing the MicroVAX systems, students use the Mac for word processing, desktop publishing, and communications. Each of the 11 section libraries at the school has four Macs used specifically to access Westlaw, a law database.

Software programs are available on two of CUNY's *AppleShare* file servers, one of which is a Mac II with an 80MB hard disk. Programs and documentation are also kept in the school's main library for students to check out as necessary. In the study areas–student cubicles and even the main library desks–network connections are plentiful so that students can bring in their own computers to connect to the school's network.–*Brita Meng*

The Complete HyperCard Handbook

Some software programs have all the luck. For instance, on the day *HyperCard* was released, an equally groundbreaking guide book was made available. While Bill Atkinson and friends were inventing *HyperCard,* Danny Goodman was right there, trying out the results and writing them up in *The Complete HyperCard Handbook.* The purpose of this collaboration was to demystify a complex and hard-to-describe program.

HyperCard's dual nature makes the task of composing a worthwhile handbook even more challenging. On its face, *HyperCard* provides a versatile method of constructing a database you can easily navigate using visual cues. Under *HyperCard*'s surface is a language called HyperTalk, which Atkinson cowrote with Dan Winkler. HyperTalk is an almost conversational programming language that makes creating Macintosh programs possible for all of us. *HyperCard,* in effect, allows you to fiddle under the hood of the elegant Macintosh interface.



The Complete HyperCard Handbook serves both powerful functions admirably. It's a tome of 700 pages, fluff-free and exhaustive. It treats such subjects as the mechanics of making cards and assembling them into *stackware;* creating links; and writing instructions in HyperTalk.

Goodman's book also provides in-depth coverage of another *HyperCard* surprise: a multifeatured paint program. Even if you don't normally use paint programs, you'll find yourself creating graphics in *HyperCard* regularly.

Although *The Complete HyperCard Handbook* was not meant to be a reference book per se, it can be used as one. I was involved in a small group whose task was to convert the entire *Whole Earth Catalog* into many thousands of *HyperCards.* We were able to pick up a number of tips from the *Handbook.*

HyperCard, with its tools-for-making-tools structure, is simply one Macintosh program that you won't be able to exploit fully without supplemental help. For the immediate future, this is the book to get.
–*Kevin Kelly*

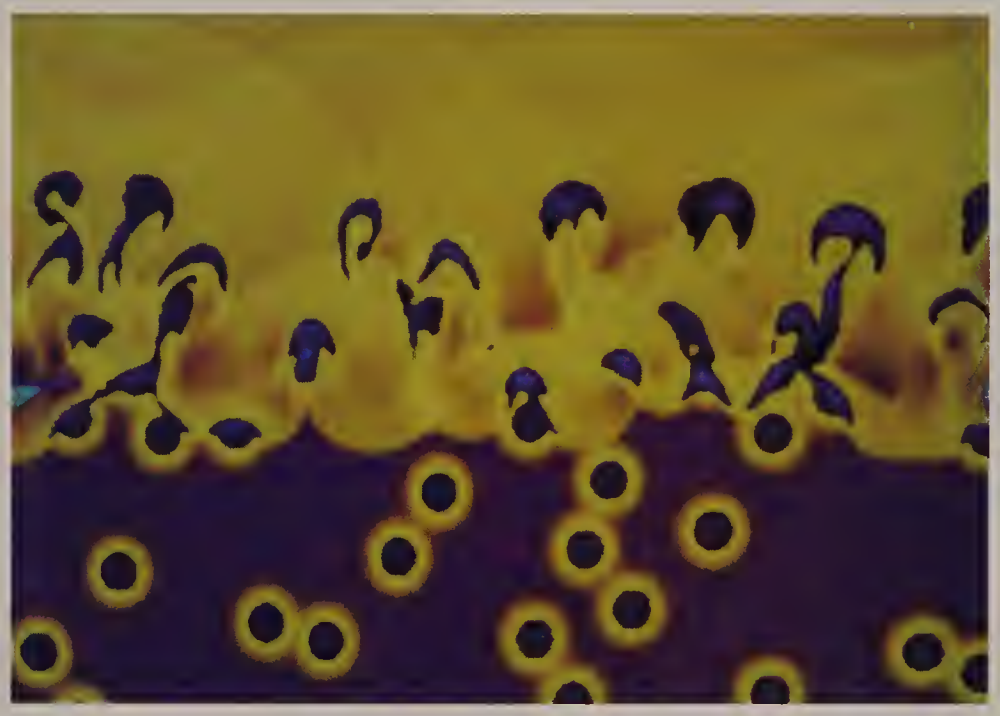
MacCray or CrayMac?

According to Brand Fortner, special programs coordinator at the University of Illinois's National Center for Supercomputing Applications (NCSA), the center is "bringing supercomputer power to the masses." Well, at least to those owning a Mac and some communications software. That's all it takes to plug into the center's new Cray X-MP/48 for a connection that puts the Mac at the forefront of computerized scientific research.

Here's how the Mac-Cray interface works: when you log on, the Cray appears as a window (or windows) in MultiFinder. Instead of an application program, however, each window leads you into a session on the Cray. You can prepare processing jobs on the Mac, send them via NCSA Telnet to the Cray for processing, get the results up to 100,000 times faster than with a Mac, and then cut and paste the data into other programs. Supercomputing results have never been so easy or convenient.

The Cray's present operating protocol will be replaced by the Cray Finder, a simpler, icon-based environment like the Mac's. In addition, users will have access to the NCSA's new image-processing program *Imagetool,* which anticipates the move from numbers (bytes) to images (megabytes) as the basic unit of computerized scientific data–a move that's necessary because of the almost incomprehensible volume of numbers yielded these days by scientific research.

Astrophysicist Mike Norman developed *Imagetool* to interpret his unmanageably complex data about extragalactic jets. The program translates that data, which would otherwise take a bewildering matrix of graphs to represent, into graphic simulations in motion.



A shock wave from an exploding supernova moves down through intergalactic clouds, changing their shapes and possibly causing the formation of new stars, new galaxies, and new worlds.

Imagetool, along with the Cray Finder, should be part of the Mac-Cray interface in just a month or two. Even at its present stage, however, the interface is like starting up a Volkswagen and finding yourself flying a jet.–*David Dobbs*

The Best COMPUTER SUPPLIES

P.O. Box 610370
San Jose, CA 95161-0370
(415) 659-1114

Just Got Better!

Simply Place an Order From this Ad and We'll Include our 52 Page Full Color Catalog FREE!
Featuring over 700 Computer Supplies and Accessories (offer good while supply lasts)

Free Offer!

Free Offer!

The Best in Mac Supplies



		20+	100+
SONY OR maxell	3½" SS/DD	1.09	1.02
	3½" DS/DD	1.59	1.49

Call for Larger Quantity Discounts

wabash DATATECH DISKETTES

	20+	100+
3½" SS/DD	.99	.95
3½" DS/DD	1.19	1.15

Boxed in Tens – Minimum Order: 20



AMARAY
Media Mate 3
Holds 30 3½"
$7.95
with lock
$9.95





Teakwood Diskette Files
Holds 45 3½"
$16.95
Holds 90 3½"
$26.95
Holds 135 3½"
$36.95

Mac-Packs
Boxed in 50's – Labels Included

	SONY OR maxell.	50+	100+	400+
	3½" SS/DD	.99	.95	.89
	3½" DS/DD	1.29	1.25	1.19
Best	3½" SS/DD	.99	.95	.89
	3½" DS/DD	1.09	1.05	.99



MicroComputer Accessories, Inc.
Deluxe Rolltop File
Holds 55 3½"
$15.95
with lock
$17.95

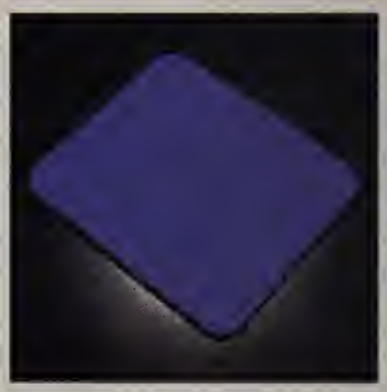
Order Now 7 am to 6 pm Pacific Time
10 am to 3 pm Saturdays

1 (800) 351-BEST 1 (800) 351-2378
1 (800) 451-BEST In California

FAX (408) 435-3002

Get your FREE 52 Page Color Catalog with Order

Minimum Order: Orders under our $25.00 minimum will be charged a $2.00 handling fee.
Payment Terms: Our terms are Visa, MasterCard, C.O.D. or Prepaid. Corporations rated 3A2 or better, government agencies and schools may send in purchase order on a Net 30 Day basis. C.O.D. orders add $4.00. No sales tax outside CA.
Shipping Charges: Shipping charges are $3.00 per 100 diskettes. Accessories and other items are charged a flat $3.00 charge per order (within the Continental U.S.). APO, FPO, AK, HI, PR and Canada orders add an addition 10% to cover PAL and insurance. All other international orders must be accompanied by a Visa or MasterCard so that we charge the correct postal charges.
Warranty: In no event shall Best Computer Supplies be liable or responsible for incidental or consequential damages of any kind.
Satisfaction is guaranteed on all products.





Mouse-Pad In Black-Blue-Grey-Brown-Red
$5.95

Tef-Glides
Teflon Mouse Feet
Make Your
Mouse Glide.
$2.95

Mouse Hous
Add a bit of
Personality
to your Mac.
$5.95





disk·book from MicroStore

Disk Book 10.... **$9.95**
Holds 10 3½"

Disk Book 32 ... **$19.95**
Holds 32 3½"

Disk Book Plus ... **$19.95**
Holds 16 3½", Plus Manuals, Pens, etc.

Available in Blue Red Burgundy Grey



EHMAN ENGINEERING, INC.
800K Disk Drive
- Totally Silent
- LED (so you know the silent drive is running)
- Compact, style matches Mac
- 12 month warranty

$199.00



Beck-Tech
Fanny Mac
Cooling Fan
prolongs Mac life.
Cools by 50°
or more.
$74.00

New Item! **MORE OF THE BEST MAC ACCESSORIES** + over 700 more can be found in our new 52 page full color catalog for just $2.00

Turbo 2400 Mac-Modem
- 2400/1200/300 bps
- Fully Hayes Compatible
- Speed Upgradeable to 4800, 9600 and 19,200 bps
- 5 Yr. Warranty • Help Screen

$249.00 Includes cable and software

Mac Carrying Case	$55.00	DataShield 200 Watt Back-up Power Source	$299.00	Mac Plus to Imagewriter II 8' Computer Cable ...	$12.50
Mac Plus Carrying Case ...	59.00	Copy II Mac Software...	24.00	Mac Plus to Hayes Modem 8' Computer Cable ...	12.50
Imagewriter II Carry. Case..	49.00	Curtis Univ. Printer Stand...	14.95	Inland 6 Outlet Surge Protection.....	19.95
Mac & Keyboard Cover ...	12.50	Glare/Guard for Mac....	24.95	Imagewriter Ribbons Black (2-5) 3.45 (6+)	2.95
Mac Plus & Key. Cover....	12.50	3½" Head Cleaning Kit...	9.95	Color 6 Packs	20.70
Imagewriter I & II Cover	7.50			Imagewriter II 4 Color...	13.95
				MacInker Ribbon Reinker...	44.00
				MacInker Black Ink (2 oz.) ...	3.00



Circle 373 on reader service card



Some may call it electronic slide storage. But the ability to paste 16.8 million colors into a page layout has major implications.

Great Color, Lots of Storage

Every once in a while, technologies come together and wonderful things happen. This time, they're happening to color on the Macintosh.

Color began on the Mac II with Apple's video card, which displays up to 256 colors on the screen–very impressive. Then, as soon as Apple began ramping up production of the II, we heard about video cards offering up to 16.8 million colors. The result was photographic-quality images suitable for many demanding applications.

Think of the potential market: all those magazines, catalogs, advertisements, newsletters, brochures, annual reports...even newspapers. They could use more color at reduced cost if they could computerize the processing and pasteup of color images.

But because each color image can require 1- to 4MB of memory, lots of mass storage was needed. Now, that storage technology is coming to the Mac in the form of optical memory called WORM (write once, read many), which can hold 50 gigabytes of information in a changer that holds 50 WORM disks.

MicroDynamics is putting it all together using a 24-bit color video card from Raster Ops. Here's how it works. A color slide is scanned, and the electronic image is displayed on a Mac II using the video board. The image is then stored on the WORM drive. Later, the image is recalled to the screen, processed, cropped, and pasted into a page layout. Other software will create the color separations, and the resulting negatives will be ready for the pressroom. For further information, call MicroDynamics in Silver Springs, Maryland, at 301/589-6300 or Raster Ops in Cupertino, California, at 408/446-4090.

This Little dBase Went to Market

Finally, after being announced over a year ago, Ashton-Tate's *dBase Mac* is on dealer shelves. The program supports color on the Mac II and utilizes files directly from other *dBase* applications–important because the *dBase* family makes up over 60 percent of the United States retail database market, according to Ashton-Tate.

Much of *dBase*'s success can be credited to the hundreds of developers who have written custom applications since *dBase II* was introduced for CP/M computers in 1982. These developers haven't been forgotten in *dBase Mac,* which includes a "protect" mode to keep users from altering the custom-written code. A run-time version of *dBase Mac* is being prepared so applications can be utilized by a developer's clients without their having to buy the more expensive *dBase Mac.*

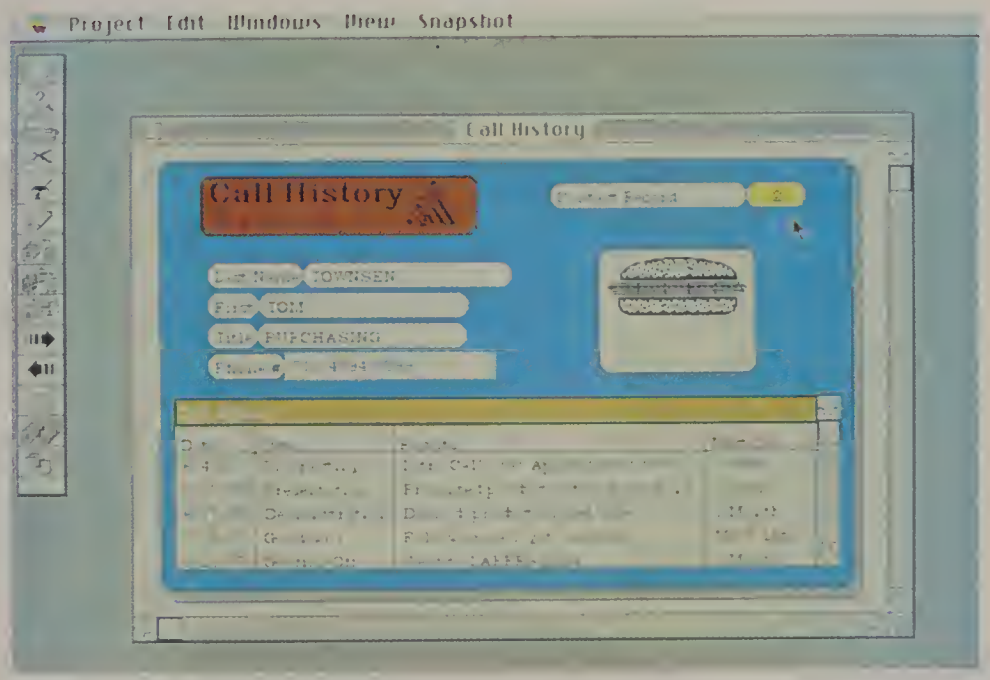
Using *dBase Mac,* you can export and import data to and from *Microsoft Excel, Microsoft File, 1-2-3, Omnis 3 Plus, Double Helix,* and *Framework,* all via ASCII text files.

Former versions of *dBase* required learning a high-level programming language. But through use of the Macintosh graphics interface and extensive pop-up menus and dialog boxes, *dBase Mac* performs many database functions without requiring programming. That doesn't mean a manual won't be needed–as with any complicated program, there's much to explain. If needed, the programming language is available for direct database manipulation.

Ashton-Tate maintains that while all other Macintosh databases provide only one-way relationships between data, *dBase Mac* is a truly relational database because it establishes two-way relations between various fields. Other features offered by *dBase Mac* include a virtually unlimited number of files and reports with custom formatting and graphics.

The $495 price of *dBase Mac* positions it squarely against Odesta's *Double Helix* and Blyth's *Omnis 3 Plus.* Higher up the price ladder is Acius's *4th Dimension,* which lists for $695 and offers multiuser functionality for networked applications.

Early purchasers of *dBase Mac* reported they were unable to get the application templates manual and disk promised on the warranty registration card. Ashton-Tate told *Macworld* that it was indeed unable to supply the manual and disk until some two months after shipping the program. For more information, call Ashton-Tate in Torrance, California, at 213/329-8000. □



dBase Mac ***features an advanced relational database. Its reports, designed using drawing tools, can include photos, drawings, and bit-mapped images for a customized look.***

Hurry up and

Whether it's a two-page letter or a 100-page report, the whole point of writing is to get to the point. And nothing gets you there faster than Microsoft® Word, Version 3.



Moving an outline heading moves its associated text. So you can not only organize your thoughts, you can quickly rearrange your words, too.

That's because Word is not your ordinary word processor. In fact, it's not a word processor at all.

Word is the Macintosh™'s first document processor.

And it's specifically designed to take you from outline to output, without getting you bogged down in details.

That's why you'll find a combination of powerful features in Word you won't find anywhere else.

Like an integrated outliner for organizing your thoughts. And for rearranging pages of paragraphs with a simple click of the mouse.

Likewise, a simple mouse click is all you need to check and correct your spelling, using Word's built-in, customizable 80,000-word dictionary.

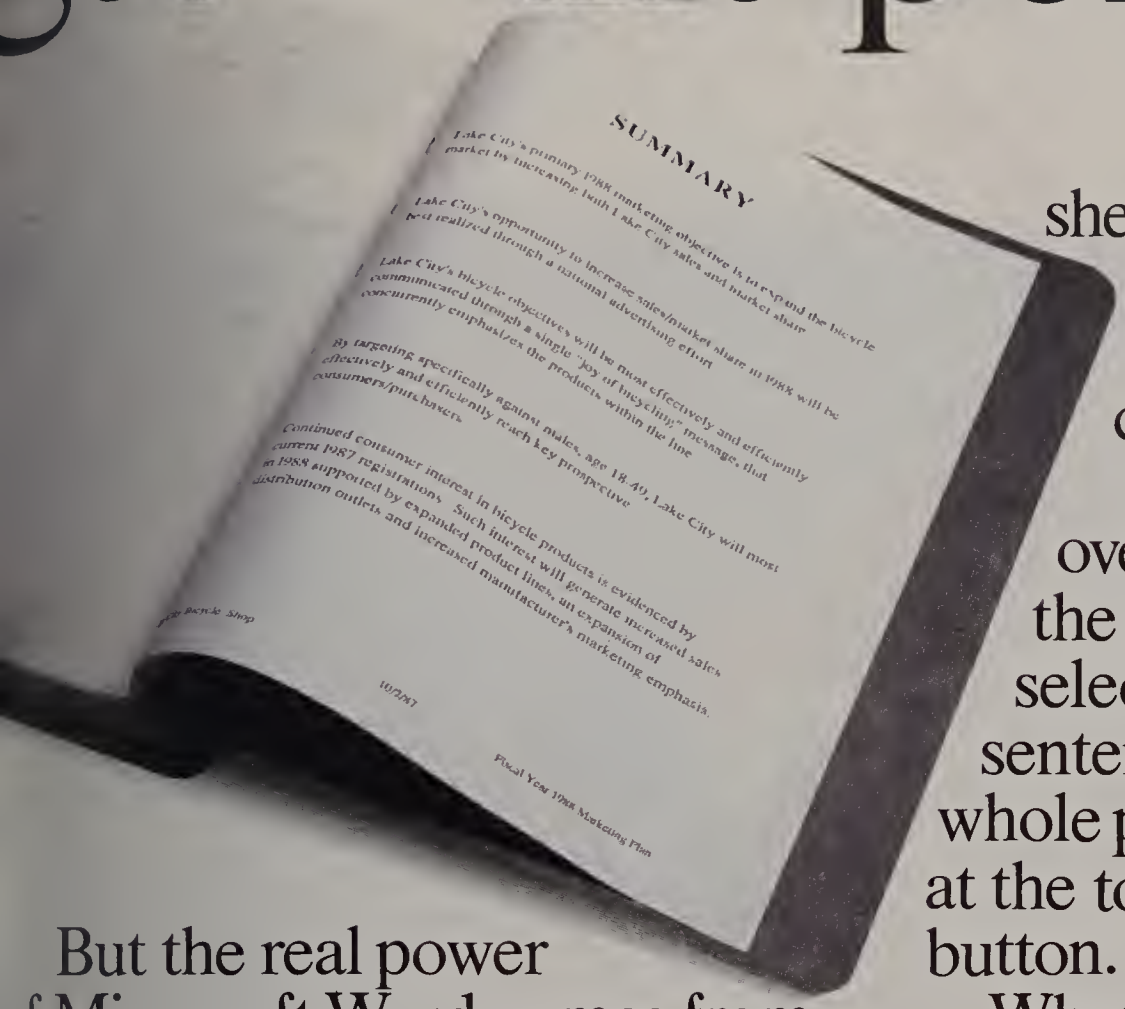
Plus you can preview and adjust page layouts before you print. Customize menus, so the files, fonts and formats you need are always at hand. Even assign Word the time-consuming chore of generating a complete index and table of contents.

All critical, professional features that strip hours off the task of turning rough thoughts into crisp, persuasive documents.



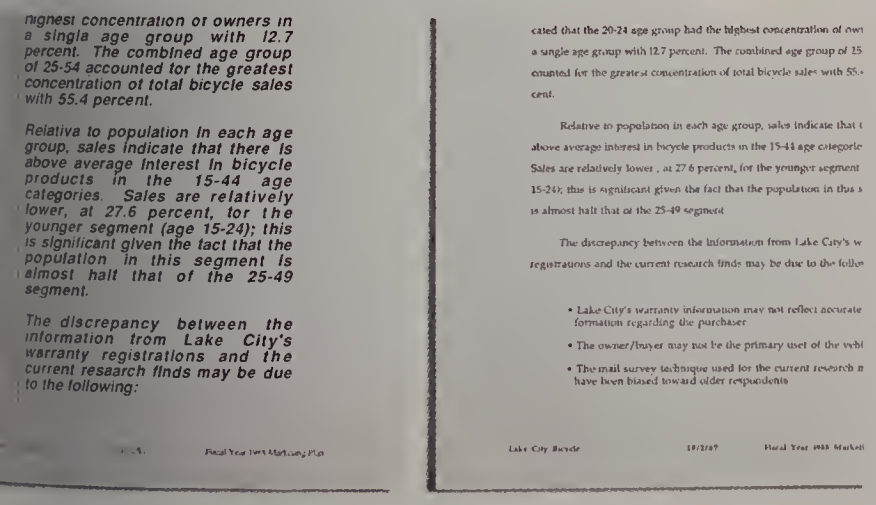
For more speed, Word lets you duplicate all mouse functions from the keyboard.

get to the point.



But the real power of Microsoft Word comes from the major time-saving features available while you input, edit and format your work.

Advanced features, like command and accelerator keys, that


highest concentration of owners in a single age group with 12.7 percent. The combined age group of 25-54 accounted for the greatest concentration of total bicycle sales with 55.4 percent.

Relative to population in each age group, sales indicate that there is above average interest in bicycle products in the 15-44 age categories. Sales are relatively lower, at 27.6 percent, for the younger segment (age 15-24); this is significant given the fact that the population in this segment is almost half that of the 25-49 segment.

The discrepancy between the information from Lake City's warranty registrations and the current research finds may be due to the following:

cated that the 20-24 age group had the highest concentration of own
a single age group with 12.7 percent. The combined age group of 25
counted for the greatest concentration of total bicycle sales with 55.
cent.

Relative to population in each age group, sales indicate that t
above average interest in bicycle products in the 15-44 age categorie
Sales are relatively lower , at 27.6 percent, for the younger segment
15-24); this is significant given the fact that the population in this s
is almost half that of the 25-49 segment.

The discrepancy between the information from Lake City's w
registrations and the current research finds may be due to the follo

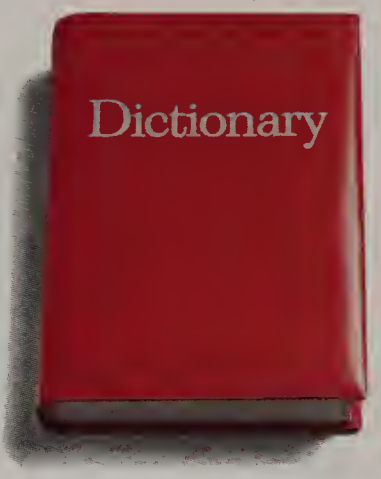
- Lake City's warranty information may not reflect accurate information regarding the purchaser.
- The owner/buyer may not be the primary user of the vehi
- The mail survey technique used for the current research m have been biased toward older respondents.

Lake City Bicycle 10/2/87 Fiscal Year 1988 Marketi

With style sheets, you can change from one format to another with just a click of the mouse.

duplicate every mouse function while you keep your hands on the keyboard. Glossaries, for recalling frequently used text with a few rapid keystrokes. Style sheets, for saving and reusing type styles and formats with a simple point and click.

And obvious, but often overlooked time-savers, like the ability to select words, sentences or whole paragraphs at the touch of a button.

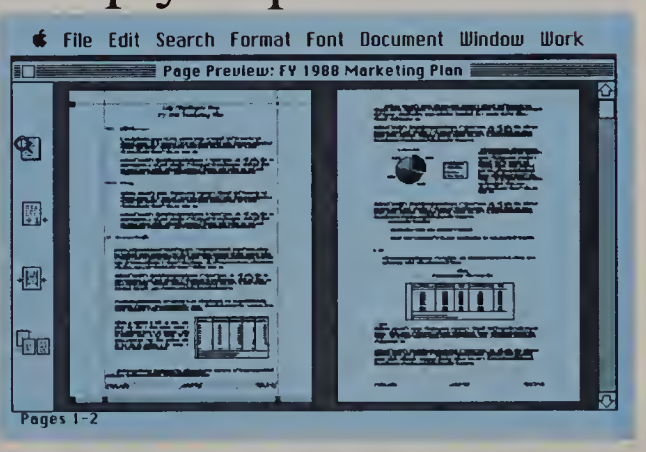


What can Word do for you? The answer can be found at your local Microsoft dealer. For the address of one near you call (800) 541-1261, Dept. B65.

What's the difference between Word's built-in spelling corrector and a secretary with a dictionary? How about a couple of hours.

Ask him to help you put Word to work in preparing your most complicated documents.

And in no time at all you'll reach your own conclusions.



Page preview saves you endless trips to the printer because you can revise page breaks and margins before you print.

Microsoft® Word

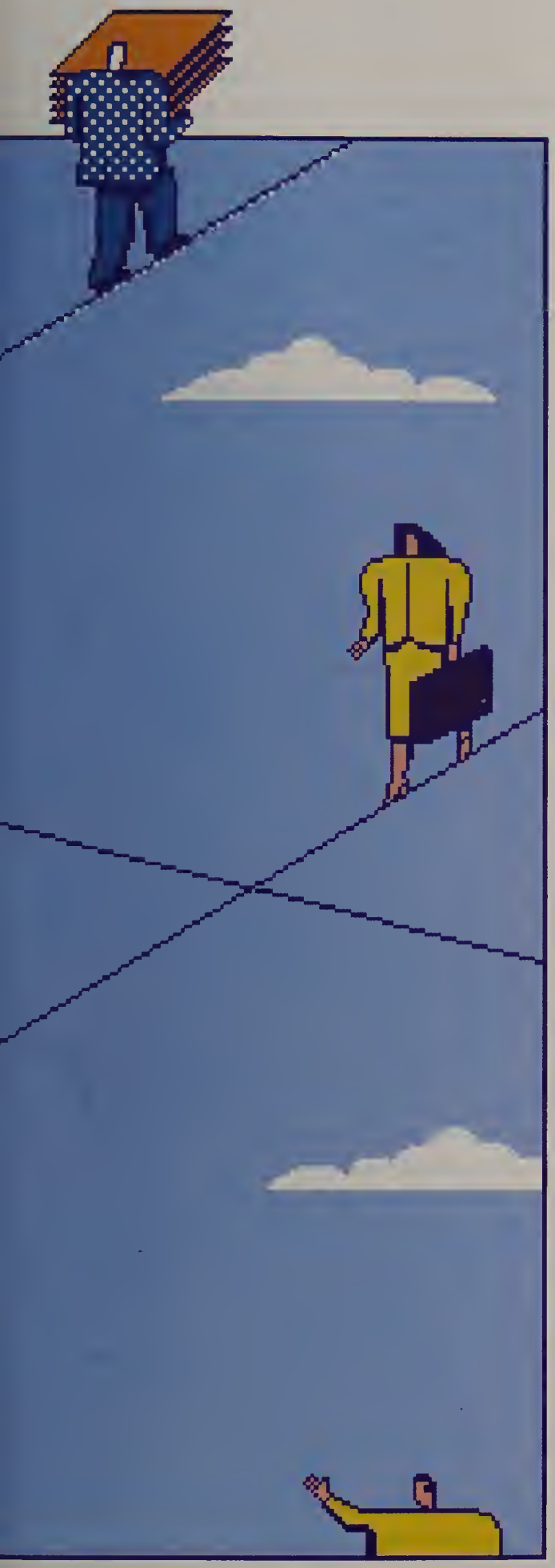
Microsoft is a registered trademark of Microsoft Corporation.
Macintosh is a trademark of Apple Computer, Inc.

Network Tales



MAX SEABAUGH

by David Ushijima



Networks, we have been told, are the wave of the future. Sun touts the network as *the* machine, and Apple's John Sculley predicts a shift to networks as the epicenter of computing power. The problem, though, is that networks aren't as easy to get running as they are to sell.

At *Macworld,* we live on a network. From the moment our editors walk in each morning until our disk drives spin down for an evening landing, we meet in the electronic aisles that make up *Macworld*'s AppleTalk link.

Twenty-three people currently inhabit our networked office, including our East Coast Editor 3000 miles away in Boston (see "Who's on the Net"). More than half of these people are heavy network users, generating a steady flow of network mail, corresponding over the network modem, and constantly transferring articles to the file server or spooling them to the LaserWriter. We even find time for an occasional session of *Maze Wars+*.

Although it has taken a while, most of the staff now use the network as freely and as often as they do the telephone. However, getting to this point wasn't easy. Our net construction was filled with twists and turns, the troublesome stuff nobody mentions. Nothing was as simple as the manufacturers would have us believe.

Mail in a Box

After LaserWriter printing, network mail is the service we use most often. In our office, dropping a memo on the seat of an editor's chair gets a quicker response than putting it in the in-box on his or her desk. Surprisingly, the network mail box now ranks on a par with the chair seat for most people. Editors have been known to respond to an electronic memo even before sitting down.

In the year we've had *InterMail* running on a Mac Plus with an AST-4000 hard disk, the program has rarely crashed and has never permanently lost data–a testament to *InterMail*'s design and the AST-4000's durability. In fact the only major problem I've had with *InterMail* was when I plugged my Mac II into the net. So anxious was I to see the dazzling graphics that I completely forgot to check whether the II would run on the network. The problem was, it didn't. In trying to send mail, I discovered the Mac II would sporadically crash as soon as I pulled down the *InterMail* desk accessory.

A quick phone call to Interactive Network Technologies in Massachusetts uncovered the problem. We were running version 1.0 of the *InterMail* software; with the Mac II we would have to upgrade to version 1.35. The InterNet folks were kind enough to rush out an update disk, but nevertheless it was another two days before I could open my mailbox.

Network Tip: New machines invariably require new versions of network software. Before adding Mac SEs or Mac IIs to your network, find out from the manufacturers if new versions of network software are required.

Creaks in the Night

A network is one of those things you never think about until it starts misbehaving. In fact, when it's working smoothly the network is as invisible as it is silent. Our trouble began with a creak.

After running *AppleShare* 1.0 for nine months, the 80MB hard disk on which it ran started rattling. Cars warn owners of impending disaster in the same way, so it was no surprise when the rattle developed into a loud clatter. As you might have guessed, the disk crashed, bringing file service to a halt on the network. It's bad enough when a personal disk drive falters, but when the network file server quits, inconveniences–and the blood pressure of our network manager–multiply, in our case by 23.

Avoiding Network Grief

The answers to the most aggravating network problems can usually be traced to the simplest things. Here's a list of practical tips that will make your day on AppleTalk run a little more smoothly.

- Install Kensington Microware's connector clips on all AppleTalk connectors. You'd be surprised how often a problem is due to a loose connection. We've wasted days tracking down the strangest problems, only to find a loose AppleTalk connector.
- Remember to select both a service and a device using the Chooser. Choose the network service icon from the left side of the window, then choose the appropriate device from the scrollable list.
- Verify your user name in the Chooser. If you recently copied a System file from someone else, be sure to enter your own user name in the Chooser. By leaving the previous user's name in the name field, you may prevent that user from logging on to a network service.
- Check the Caps Lock toggle key. If you've been having problems logging on to a program that's protected by a case-sensitive password, be sure the Caps Lock key is up.
- Pick a consistent user name for all your network applications. For example, if I register myself as "Eileen Drapiza" in an application like *InterMail*, I should not register myself as "Drapiza, Eileen" or as "E. Drapiza" in *AppleShare*. The Mac uses the name you enter in the Chooser to log on to each network service. Consistency makes a big difference.
- Make sure you are running the most current version of the system files. Using different combinations of the System and Finder on one network can wreak havoc. Check with the network administrator for the latest System, Finder, and LaserWriter files. If you must boot from a disk containing an old System file, disable AppleTalk on your workstation (from the Chooser).
- Make sure you've plugged the AppleTalk connector into the printer port. It's easy to mistake the modem and the printer port. If you pick the wrong one, you'll receive a message saying "Your document can't be printed. Make sure AppleTalk is installed and a printer chosen."

—Eileen Drapiza

Our first thought was to restore the file server from the image file we had saved on tape. But as luck or Murphy's Law would have it, no matter what we tried, we couldn't coax the MagNet 85X's built-in tape drive to read the tape. Coincidentally, Eileen, our network manager, had just received *AppleShare* version 1.1. After reading through a list of bug fixes, and living through numerous *AppleShare* crashes, we decided to upgrade.

We ended up reinitializing the hard disk and installing *AppleShare* version 1.1 from scratch. Fortunately we all had backed up our own data from the file server, prompted by flashbacks of the last disk crash.

Network Tip: If possible, test drive a hard-disk file server on a network before you buy it. Try backing up the server and restoring its contents from tape.

Check with the manufacturer if you want to back up an *AppleShare* volume file by file. Several companies offer updates to their backup software that will let you do this. Attempting to restore from a file-by-file backup, however, usually means you lose the access privileges and ownership information from all folders and documents. If you run without a network backup device, remind users that they must back up their own files regularly.

New Life for Fractured Ears

Even though upgrading to *AppleShare* 1.1 had done wonders for our faith in file servers, we (or more specifically Mark, who had to work with the clatter of the file server in the background) still had to contend with the rattle of the disk drive.

Eventually we decided to replace the MagNet 85X with NuData's GigaCell, a 300MB disk and tape drive designed from the start for reliability and heavy network use. The GigaCell is a product that looks and sounds the part of a high-quality machine. But even though the GigaCell is the type of product that instills confidence, it was not without its share of problems.

Having made the decision to swap drives, we daisy-chained the GigaCell to the MagNet 85X, hoping to copy all our files. No luck. Both drives contained SCSI terminators, neither of which were accessible from outside the case. Despite proving her dexterity with needle-nose pliers, and after logging enough hours to launch a second career as a technician, our network manager could not successfully chain the drives. We finally resigned ourselves to reinstalling the file server software from scratch.

Although we were now able to run *AppleShare* from the GigaCell, we still had a problem. The drive contained 300MB of storage, but we could only access 150MB of it. Eric Herzog of NuData explained that our drive actually contained two 150MB drives driven by a single SCSI controller board. The current version of *AppleShare*

software, however, only recognizes one drive per controller. The plot thickened. The solution was for us to upgrade to a single 300MB drive, which NuData agreed to install. The 300MB drive would in turn require a ROM change in the drive's SCSI controller, so that we could start up from the hard disk rather than from a floppy–and the ROM upgrade was not yet available from CDC. Finally, we decided to run *AppleShare* on two 150MB DataCell drives.

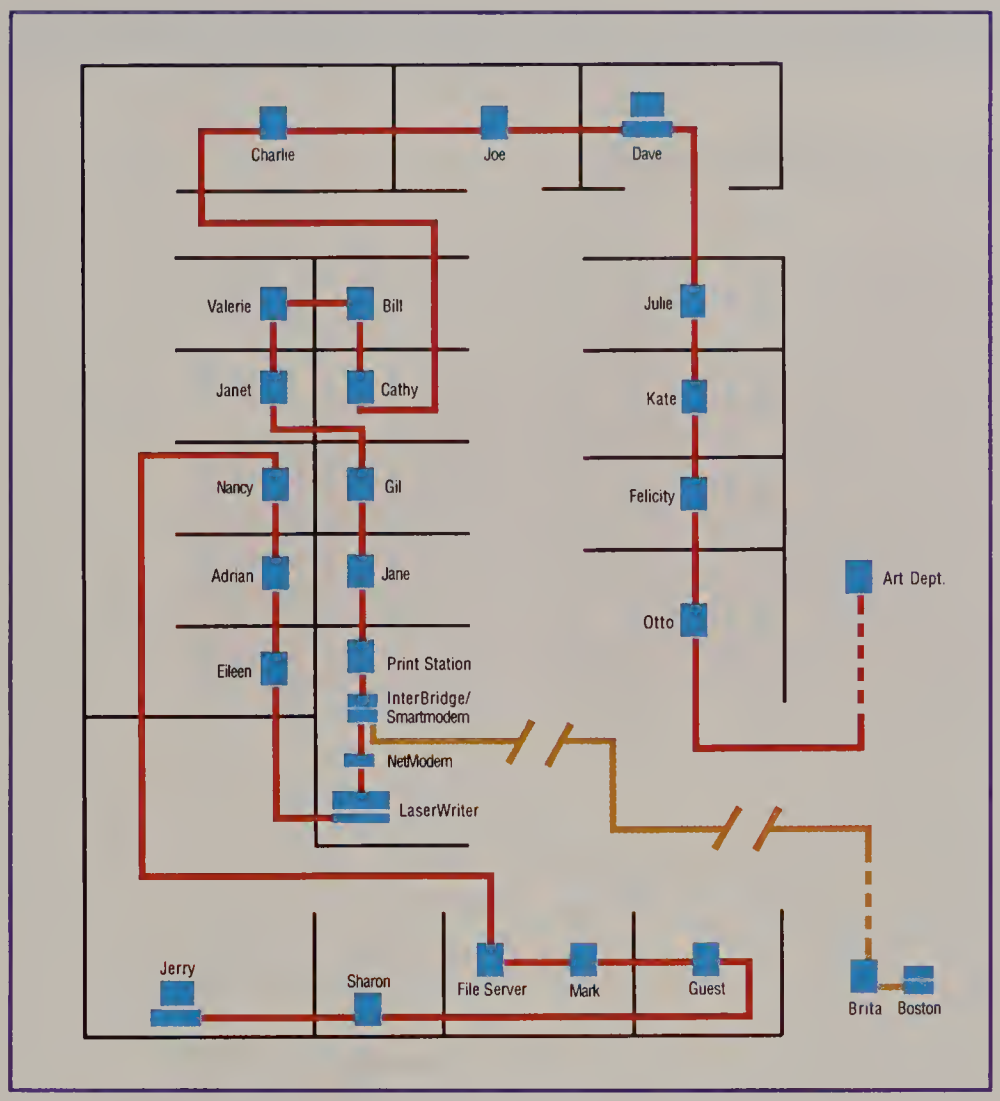
Network Tip: When shopping for a hard disk to use as a file server, look for one designed with reliability and durability in mind. Pay attention to overall construction quality. The mean-time-between-failures figures for a drive often reflect how long a drive will last. Remember that on a network, the drive will be running continuously and will most likely get a heavier workout than a personal disk drive. If you plan to chain drives to the server, find out how easily you can remove the SCSI terminators and change the SCSI address.

My Memo, Your Paper

Everyone prints on the LaserWriter and no one likes waiting. So our decision to install *LaserShare,* Apple's LaserWriter spooler, was a popular one–at first. Although *AppleShare* 1.1 ties up one Mac as the file server, it lets you run a foreground program like *LaserShare* in return. For me this was great, because I had been running Think Technologies' *LaserSpeed* spooler on my Mac Plus. When I switched over to the Mac II, however, the version of *LaserSpeed* I had (1.0) would continually crash. *LaserShare* cured my spooler withdrawal.

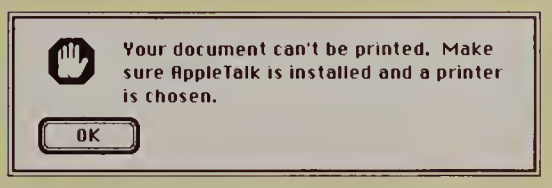
Within an hour after our network manager installed *LaserShare,* a rather heated discussion developed around the printer. Previously, anyone could select Manual Feed from the Print dialog box, start printing, and then race over to the printer and insert letterhead in the feeder. Now if you tried that you might get a letterhead version of someone else's report. Once we discovered (and turned on) *LaserShare*'s Bypass option, users could print directly to the LaserWriter, and things returned to normal.

Network Tip: Allow users to select or bypass network services. Don't assume everyone will do things the same way on the network. Allow for as many variations as possible. One of *AppleShare*'s strengths is that it lets people do things in a variety of ways without dictating how they should use the network.

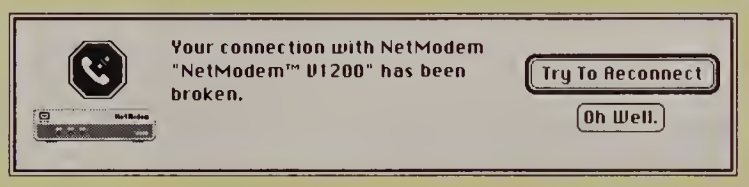


Who's on the Net
Our network connects the Macworld *editors in San Francisco, the art department, and an editor in Boston. Keeping 23 Macs, a LaserWriter Plus, a NetModem, an InterBridge, and an* AppleShare *file server running smoothly has been no easy job for our network administrator.*

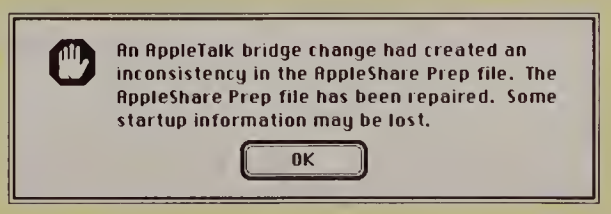
Network Messages We Have Known



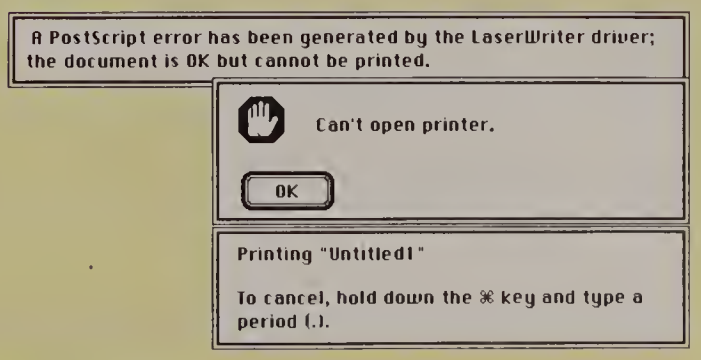
If you accidentally plug the AppleTalk connector into the modem port, you'll get this error message when you try printing.



If you see this one while you're online, it's time to move the NetModem out of reach.



Shortly after installing the InterBridge, our file server crashed. This is the message we got after rebooting the file server.



It took us a day, but we traced this problem to a loose AppleTalk connector. The LaserWriter would appear and disappear from the Chooser's device list. Because we were using custom AppleTalk cabling, the cable was unterminated.

Boston, California

By linking the Boston office to our network in San Francisco, we were able to expand our network services as well as our editorial coverage. But adding a remote bridge to an editor 3000 miles away proved to be as much a lesson in patience as a boon to our productivity.

Although several remote bridge products had been announced, some as long as nine months ago, the Hayes InterBridge was still the only one shipping. Even though the InterBridge has been around for two years and was one of the first AppleTalk devices available, that was no indication of its maturity as a product. In fact, getting it running took more time than I expected and uncovered a few problems.

To start with, most modems advertise themselves as Hayes-compatible, meaning that they implement a majority of the same commands found in Hayes modems. When it comes to connecting the InterBridge to a modem, you should take Hayes-compatibility seriously. I spent the better part of a day trying to get two Novation Professional 2400-baud modems working with the InterBridge—to no avail. When I finally tried two Hayes Smartmodem-2400s, things went much more smoothly.

That's not to say that from then on installation was a breeze. While most of the set-up procedures are straightforward, the most annoying part is having to program the modem by typing a series of cryptic commands. After typing these commands a few times, I got familiar enough with them to recite them in my sleep—nevertheless, having to enter cryptic commands is not Mac-like.

After making numerous voice calls to Boston and repeatedly reprogramming the modem, we finally got the InterBridge working. It was nothing short of amazing when Brita, our East Coast Editor, first printed a document on our LaserWriter. The idea of sending a document to a printer 3000 miles away somehow seems ridiculous, but it opens your eyes to the potential of networks. Shortly thereafter, we got *InterMail* running over the InterBridge with no problems at all. While network mail isn't fast, it's as effective between offices as it is within the office. And even though Hayes doesn't recommend running a file server over a remote bridge, we had no trouble getting *AppleShare* 1.1 running. Other than its sluggish performance at 2400 baud, it's no worse than downloading a file from AppleLink. And from my initial estimates, it's still cheaper—AT&T's daytime long-distance rates to Boston are about $18 per hour versus $25 per hour for *AppleLink*.

While the InterBridge hasn't solved all our communications problems, it sure beats fighting time zones and unreturned phone calls. And although InterBridge's price, $799, inhibits its usefulness as a remote bridge for single Macs, it's a very effective way for two remote networks to communicate. Even at $799, having the remote mail service is by itself worth the price of admission.

The Network Switchboard

Although we now had communications working within our office, we still needed a way to connect our network with the outside world. The solution arrived in the form of a product I had seen demonstrated a few weeks before. Shiva, a company based in Cambridge, Massachusetts, had announced a modem that actually connected to a network rather than to a single Mac. Otto, who downloads our *AppleLink,* MCI, and CompuServe mail daily, understandably couldn't wait to see it. Not surprisingly, we installed the NetModem the day after it arrived.

Somehow it's rather amazing to hear the familiar, albeit scratchy, sounds of a dialing modem emanating from the Mac. The NetModem is one of the most useful network devices I have seen yet. On the other hand, seeing the NetModem in action on the network points out the hazards of sharing devices. For instance, no sooner had Adrian installed the NetModem and sucessfully dialed up *AppleLink,* than Joe, who also wanted to go online, got a dialog box suggesting that he turn the modem off and back on. After Joe dashed out to see what was wrong, and obediently turned the modem off, Adrian, who had gotten cut off in the midst of downloading a file, got a polite message telling him to try reconnecting.

Network Tip: Shutting off a shared device is sure to result in network chaos.

The Homogenized Networker

In many ways networks are averse to change. Add a new piece of hardware or install new software and the network crashes. Ironically, while the Mac encourages users to experiment with new software, Mac networks demand some degree of conformity. When you plug into a network, you lose the freedom to run whatever system software you please.

Prior to upgrading our file server software and mail software, the network had been increasingly plagued by crashes. Even after installing *AppleShare* 1.1 and upgrading to *InterMail* 1.35, many of us were intermittently finding the dreaded bomb on our screens. After adding NetModem, we knew it was time to make sure everyone was running the same version of the system software.

When it comes to running unreleased software, our editors are the worst offenders. They continually evaluate new versions of released, soon-to-be-released, and even some never-to-be-released applications,

stressing the network to its limit. We push the network and in return we endure our fair share of bombs.

Once we had several network services running, everyone had various versions of the network, not to mention the system software. Our net manager immediately sent out a memo urging everyone to upgrade. The problem was that those who weren't using *InterMail* never got the memo. Because they never received the memo, they never upgraded–it was the network version of the chicken and the egg. After posting a printed notice of the most recent system and network software on our (nonelectronic) bulletin board, our network manager embarked on a tireless crusade against nonconforming software. Shortly thereafter the daily stream of network complaints rapidly dwindled.

Even our most troublesome network holdout was cured after ridding his hard disk of extraneous copies of the *InterMail* server software and upgrading the System and the Finder. It was a sign that we were on the road to network recovery.

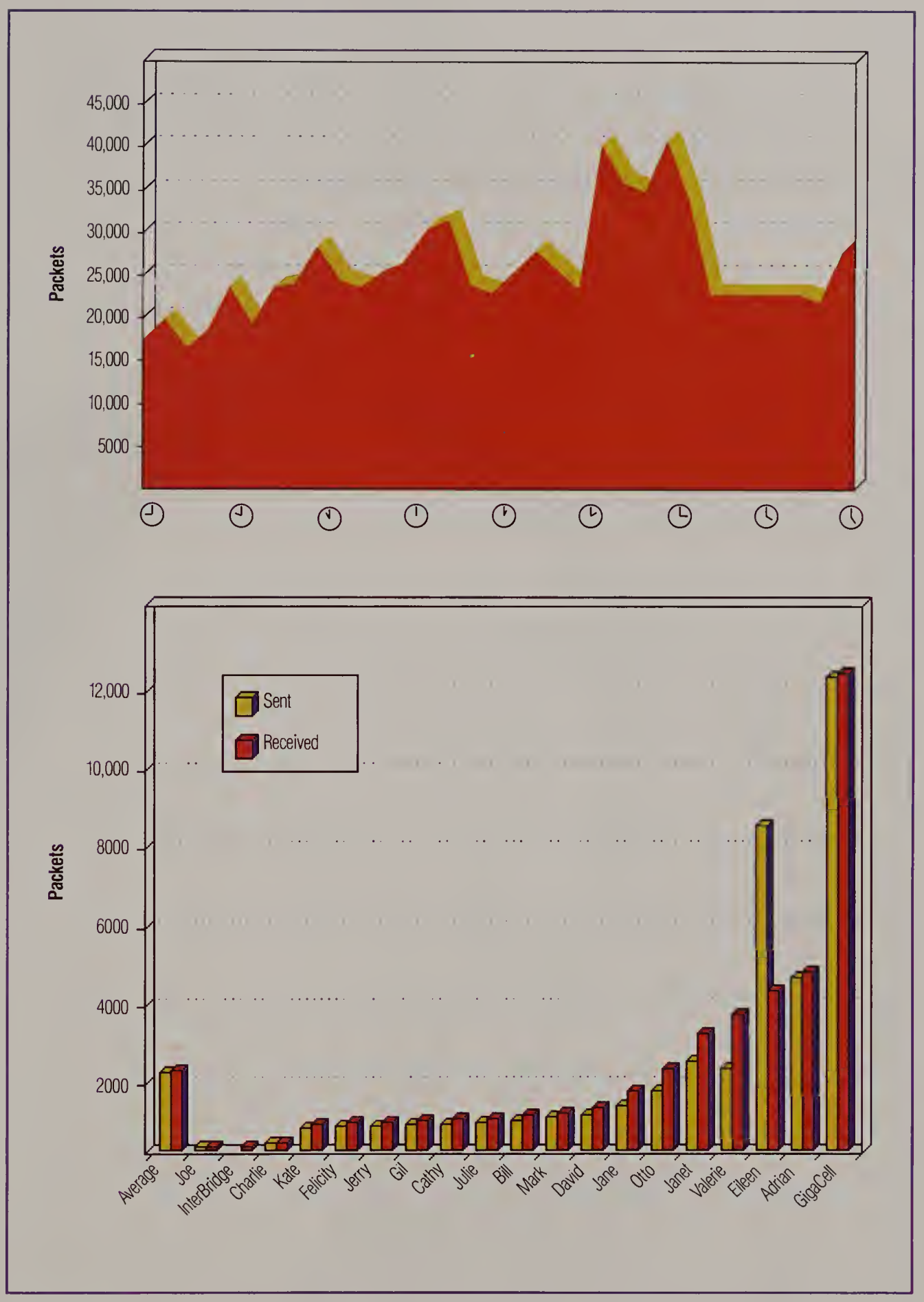
Network Tip: No Mac is alone on a network. Everyone must run compatible versions of the System, the Finder, and the software for any network services. Users who want to run unreleased software should alert the network manager or wait till after hours before bringing the network to its knees.

Well Worth the Wait

It's not all roses in our network garden. We still have our share of problems. And I expect we'll prick our fingers on a thorn or two as we add and evaluate new network products.

Despite the problems we've had, we're still hooked on the network. It's by far the fastest way to connect people and their work. Some days, I send memos on the fly and respond to the network mail almost as fast as it comes in. Whereas a paper memo could languish on my desk for hours or even days, the jingle that accompanies an *InterMail* memo always gets my attention. And besides, sometimes it's as fun to wander through gateways or browse the HyperCard stacks on our file server as it is to dodge an opponent in the maze. Excuse me–a message has just arrived.

See *Where to Buy* for product details.



Rush Hour

Farallon Computing's Traffic Watch *is essential for monitoring network traffic. In addition to reporting on the total number of packets sent (top), this program helps network managers identify traffic patterns and select locations for setting up bridges that will improve a network's performance.*

Shades of Gray



The contrast between previous scanners and the new gray-scale machines is as clear as black and white

PHOTOGRAPH BY DAVID BISHOP

by Jim Morton

Last July *Macworld* published a comparative review of popular scanners available for the Macintosh ("Scanning the Horizon"). The article's conclusion surprised some people: after asking himself which scanner was the one to buy, the author answered that maybe it would be better to wait. It was sound advice. Besides having trouble with software and standards, the scanners we looked at last year (though higher in resolution than the original Mac scanners) could reproduce photographs and other continuous-tone images with only limited success.

Now a new generation of scanners is emerging that will finally make possible the desktop publisher's dream of producing publications that can simply be sent to a phototypesetter with every photograph and piece of art in place. Because these new *gray-scale* or *gray-level* scanners can take advantage of high-resolution output devices like the Linotronic 100 or 300, they can produce halftones that are nearly indistinguishable from those made by conventional graphics cameras. And you can manipulate the gray-scale files these new machines produce in ways previously impossible, changing tonal values or sizing images without rescanning.

With these new capabilities, however, come new complexities. In computer stores around the country right now, anyone looking for scanners is liable to hear that a particular model "saves 8 bits per pixel for a total of 256 gray levels at 300 lines per inch, supports TIFF and EPSF, and offers built-in gamma correction and a user-definable dither matrix."

Sounds good, but what does it mean? To choose the right scanner today–and to get the results you want from it–you'll find it helpful to understand a few things about halftones generally, about the basic principles of halftoning with a computer, and about how the new gray-scale scanners differ from the previous *bi-level* machines. Even if you use an old scanner, having a grasp of how your machine works will give you more control over your output.



Halftoning

Black-and-white photographs contain hundreds of gray tones. Because printing presses generally print these images with only one color (black), printers must use a process known as halftoning to reproduce a full range of grays. Halftones, which printers make by reshooting continuous-tone art through special screens, are composed of variously sized dots that simulate gray values. Although dots in a given picture are of different sizes, their frequency is constant; this frequency is known as a halftone's *screen ruling* and is measured in lines per inch (lpi).

Newspapers commonly use halftones with a screen ruling of 85, which means newspaper photos contain 85 lines, or rows, of dots per inch. A 100-line screen is typical of good-quality newsletters or low-



Connecting the Dots *The number of printer dots in the dither matrix defines the halftone dot's resolution (and the number of gray levels possible). The matrix style affects the image's appearance. These three patterns all represent 50 percent dots. The leftmost is a spiral pattern, the next is a star. The 8 × 8 matrix forms the truest dot.*

budget books. Quality books and magazines (like this one) commonly use 133- to 150-line screens.

Halftones are generally produced in one of two ways. The inexpensive way is the *photomechanical transfer,* or PMT, which is printed on paper and simply pasted up along with the text on printing flats. The practical resolution limit for this technique is 100 lpi; any finer and the dots bleed together or disappear when your printer makes printing negatives from your flats. A more expensive technique skips the pasteup step and goes directly to negatives. This method produces up to a 150-line screen, though not all print shops can handle that fine a screen.

In the world of traditional, analog halftones, resolution—expressed as screen ruling—is the main index of image quality. One reason there's currently so much confusion about scanning is that in the digital world, image quality is the result of an equation with two main variables: knowing the resolution of a scanner isn't enough, you also have to know how many gray levels it produces.

The main concept to remember in Mac scanning is that as the number of gray levels goes up, resolution goes down, and vice versa; achieving the best results is always a matter of finding the optimum mix of both. For example, a 300-dots-per-inch (dpi) bi-level scanner could produce a halftone with a resolution of 150 lpi—but the image will look very crude because it will contain a maximum of 5 tonal values, including black and white. The same machine can produce an image with 26 different tones, but the resolution will be only 60 lpi. This trade-off is a result of the manner in which computers produce the different-size dots that make up a halftone.



Truvel's unique 8-bit TZ-3 is essentially a flatbed scanner turned upside down. Lights and a lens move above the copy stand, scanning books or flat media.

PHOTOGRAPHS BY FRED STIMSON

Dithering Around

Unlike photographic processes, which produce halftone dots in a virtually infinite number of sizes, printers like the LaserWriter or the Linotronic machines always print the same size dots. This means the dots you see in a Mac halftone are actually clusters of much smaller dots. (Since there seem to be no standard terms, for the purpose of this article the larger, visible dots will be *halftone dots,* and the smaller, 300- to 2540-dpi dots will be *printer dots.*)

If you use a 300-dpi printer to create a 60-line halftone, your scanner software divides the images into halftone dots that are 5 × 5 (5 across by 5 down) printer dots in size (300 dpi ÷ 60 lpi = 5). Given this 25-printer dot *dither matrix* (see "Connecting the Dots"), you can make halftone dots of only 25 different sizes. This is why, if you include white (no dot), you get 26 tonal values at 60 lpi on a LaserWriter.

The larger the dither matrix, the more dot sizes the printer can make and the more tonal values it can represent. On the other hand, a larger dither matrix means larger halftone dots—and lower resolution.

The process of creating specific screen percentages using several printer dots to form each halftone dot is called *dithering.* Turning on 50 percent of the dots in a dither matrix produces a 50 percent gray value. The order in which the software turns on printer dots on the way from white to black is also important. Different algorithms for figuring out which dots should be black for a given percentage produce different patterns and effects.

Of course, the way around the problem of trading resolution for gray levels is to use smaller dots. At the Linotronic 100's 1270 dpi, an 8 × 8 matrix (which produces 64 gray levels, the minimum for a reasonably natural look) takes up only 1/150 inch, providing a 150-lpi halftone. This is where one of the main advantages of gray-scale scanners comes in. When bi-level scanners digitize a photograph, they save the image as a *MacPaint*-like bit map. The scanning software establishes the dither matrix and assigns which printer dots



Abaton offers a gray-scale scanner only in this 4-bit flatbed design.

will be on or off. Sending a bi-level file to a Linotronic typesetter won't improve its resolution; in fact, since neither 2540 nor 1270 can be evenly divided by 300 (the sampling rate of high-resolution bit-map scanners), sending a bi-level file to a phototypesetter may result in distortion and an ugly crosshatched pattern.

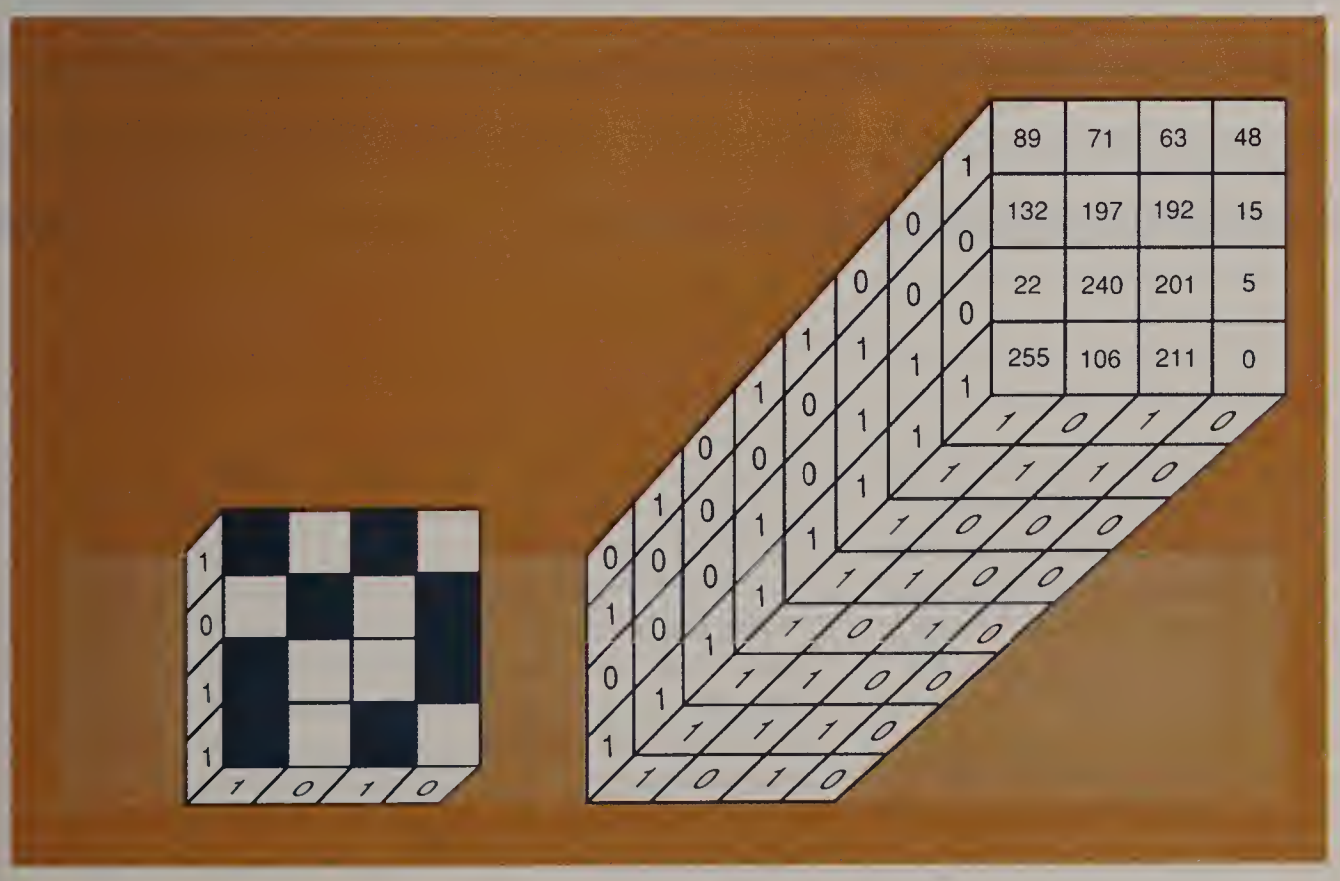
On the other hand, gray-scale scanners are to bi-level scanners as *Illustrator* is to *MacPaint*. Gray-scale scanners are *device independent,* which means they leave the decision of exactly which printer dots will be on or off up to the printer–which also means these scanners can take advantage of higher-resolution devices to make better-looking halftones.

Into the Gray Area

If you look at the illustration in "Bit Maps in Depth," you'll see that gray-scale scanners also produce bit maps, but their bit maps are "deeper." Think of the cells in the illustrations as samples made by a scanner at 300 samples per inch. For each sample a bi-level scanner takes, it registers a binary value: on or off. When the software saves the file, it looks at how many printer dots in a dither matrix should be on or off and then assembles a halftone dot of an appropriate size.

As the illustration shows, the gray-scale scanner registers far more information about each sample. The gray-scale scanner that made the samples in the illustration is an 8-bit scanner, which means that for every sample it can store an 8-place binary number corresponding to one of 256 gray values ($2^8 = 256$). The other common caliber of Mac gray-level scanner is the 4-bit scanner, which has the ability to assign a given sample to one of 16 gray levels ($2^4 = 16$).

When you save a gray-scale file, you set the screen ruling you want for output. The processor in the printer then looks at the saved information and de-



Bit Maps in Depth
You can think of bit maps from a gray-scale device as being "deeper" than bi-level ones. Bi-level scanners register that a sample is either on (black) or off (white). By contrast, the gray-level machines store 8 bits of information for every sample, meaning they can register 256 binary values (2^8). When the gray-scale file is printed, the output device interprets the gray-scale information and approximates the original tones.

Examining Scanners

Manufacturer/Scanner	Feed system	Bits per pixel	Gray levels	Samples/inch	SCSI	Adjust contrast	Adjust brightness
New Image Technology							
Magic	video	8	256	300		●	●
MacScan	sheetfed	1	b&w	75-300	●		[2]
MacScan FB	flatbed	1	b&w	75-300	●		[2]
MacScan Plus upgrade kit[3]	n/a	8	256	75-300	●	●	●
Datacopy							
Jet Reader	sheetfed	4	16	150-300	●		[2]
Model 730	flatbed	4	16	150-300	●		[2]
Model 840[3]	flatbed	8	256	150-300	●	●	●
Microtek							
MS-300A	sheetfed	1	b&w	75-300	●	[2]	[2]
MS-300C	sheetfed	1	b&w	75-300	●	[2]	[2]
MSF-300C	flatbed	1	b&w	75-300	●	[2]	[2]
MSF-300G[3]	flatbed	8	256	75-300	●	●	●
Dest							
PC Scan	sheetfed	1	b&w	200-300	●		[2]
PC Scan+	sheetfed	1	b&w	200-300	●		[2]
PC Scan 1000[3]	sheetfed	4	16	38-300	●	●	●
PC Scan 2000[3]	sheetfed	8	256	38-300	●	●	●
Abaton							
Scan300 w/C-Scan 1.5	sheetfed	1	b&w	75-300		[2]	[2]
Scan300/FB w/C-Scan 1.6	flatbed	4	16	75-300	●	●	●
Comtrex							
Imagizer	video	8	256	640[4]	●	●	●
Pixelogic							
ProViz	video	4	16	640[4]	●	●	●
Hewlett-Packard							
ScanJet[3]	flatbed	4	16	75, 300	●	[2]	[2]
ThunderWare							
ThunderScan	ImageWriter	5	16	19-300		●	●
AST Research							
AST Turboscan SF	sheetfed	1	b&w	75-300		[2]	[2]
AST Turboscan FB	flatbed	1	b&w	75-300		[2]	[2]
Truvel							
TZ-3	scanning table	8	256	75-900	●	[2]	[2]

[1] These parameters can be changed by typing PostScript commands in the editing window.
[2] Set before scanning.
[3] Prerelease information; prices and specifications subject to change.
[4] Horizontal samples.
[5] File size is constant and small.
[6] Scan adjusted for reprinting.

cides how many gray levels the printer can deliver, given that screen ruling. Thus an 8-bit file at a 150-line screen printed on a LaserWriter will have 4 gray levels ([300 ÷ 150]²); printing the same file on a 1270-dpi Linotronic 100 yields 72 possible gray levels ([1270 ÷ 150]²); while a 2540-dpi Linotronic 300 will give you more than 256 gray levels (the scanner's maximum).

The other great advantage of gray-scale files is that all the information they record per sample gives them the potential to be manipulated (via new image-processing software such as *ImageStudio*) far beyond the capabilities of bi-level bit maps (see *Reviews, Macworld,* December 1987). *ImageStudio* does have the ability to reconstruct a gray-scale file from the information in a bi-level scan. However, the results of this process are not as satisfactory as starting with gray-scale information.

To give credit where it's due, gray-scale scanning on the Macintosh is not really new: ThunderScan has always captured gray-level information. You could use this information to perform sophisticated contrast and brightness editing from within ThunderScan's software, but once you printed the file, saved it to disk, or sent it to a page-layout program, the gray-level information was lost and the file looked no better than output from other scanners.

TIFF	EPSF	Gray-map filter	Halftone screen/ angle control	Scan to disk	Gamma correction	Line-art setting	Price
●	●		1				$549
●	●		1			●	$1547
●	●		1			●	$1899
●	●		1			●	$300
●	●		2 patterns	●		●	$1300
●	●		2 patterns	●		●	$1800
●	●	●	●	●	●	●	$8995
●	●		12 patterns	●		●	$2495
●	●		8 patterns	●		●	$1695
●	●		8 patterns	●		●	$1895
●	●			●		●	$3000-$4000
●	●			●		●	$1995
●	●			●		●	$2495
●	●			●	●	●	unknown
●	●			●	●	●	unknown
●	●		2 patterns	●		●	$1895
●	●			●		●	$2295
●	●		1	n/a[5]	6		$1995
●	●		●	n/a[5]			$1595
●				●		●	$1995
●	●	●				●	$229
●			15 patterns	●		●	$1699
●			15 patterns	●		●	$1899
●					●	●	$5095

Gamma Correction

A new catch phrase you are apt to hear when purchasing a scanner is *gamma correction*. Gamma correction is like kerning in page-layout programs: a useful feature that we all managed to live without until we learned what it meant.

Although a scanner may save 8-bit gray maps, that doesn't necessarily mean that you will get 256 levels of gray out of it. Part of the problem is that some scanners save gray-scale information on a straight one-to-one basis. In the real world, the amount of information needed to accurately interpret a dark gray area is greater than the amount of information needed to interpret a light gray area. To solve this problem, some scanners save the information on a curve, so that the amount of data stored at each gray level is skewed toward the dark end of the scale. This is gamma correction.

Cutting Corners

Since gray-scale scanners save 4 to 8 bits of information where bi-level scanners saved only 1, files can grow ridiculously large in no time. A bi-level scan that takes 70K may grow to 4 megabytes when saved as an 8-bit gray map. If you try to print such a file on a Linotronic, you'll wind up mortgaging your home to pay the typesetter (see "At the Service Center").

The situation, however, is not as bad as it sounds. There are ways to decrease file size and still get the desired results. Besides TIFF (Tagged-Image File Format) storage, the single most important feature of a gray-level scanner is the ability to alter the sample rate of the scan. If you are printing a halftone with a 100-line



Video digitizers, such as this 4-bit Pixelogic Pro Viz, don't use a CCD like other Mac scanners. Instead they produce digital images from video signals.

screen, no matter what device you print on, you will get only one halftone dot for every 1/100 inch. If you scan at 300 dpi, you'll save nine samples for that one dot—a waste. Most nonvideo scanners offer a variety of scanning rates. When printed, the difference in quality between a 100-dpi gray-scale scan and a 300-dpi gray-scale scan is negligible, but the time it takes to print may vary drastically.

Another way to approach this problem is to use *ImageStudio*. Whatever the magnitude of the original file, *ImageStudio* gives you the ability to cut it down to size either by precropping it or by reducing the resolution. A document sampled at 300 dpi that is opened in *ImageStudio* at a 50 percent resolution, and then saved, will have a resolution of 150 dpi.

Most video digitizers do not offer adjustable sample rates because their available image is based on the size of the video frame, which is constant. To make up for this limitation, video digitizers offer a lot of information in a little space. Comtrex's Imagizer, for instance, creates an 8-bit gray-map file that is only 204K. On the minus side, video images are always the same size. When enlarged past the original scanning parameters, they often look ragged and unacceptable. Figure about a half-page as the practical limit for good results with these machines.

It's Caveat Time Again

Gray-level scanners offer power never before available with personal computers. But that power has a price. And, as with most things, the real price can be hidden by hype. The image-processing that gray-scale scanners make possible is a sophisticated application. To do it properly, you'll want sophisticated gear. The true cost of getting the halftones you want will probably not be limited to the initial scanner price.

For example, once you've made your scan, you need software to do something with it. Final marketing decisions for many of the gray-scale scanners we looked at had not been made when this article went to press. Abaton was shipping its Scan 300/FB, however, and the base price did not include software. To actually operate your machine, you have to buy a program.

Tip: SCSI Compatibility

The Mac can accept up to seven hard disks, scanners, or other machines daisy-chained to the SCSI port, but they all must have different device numbers. Scanner and hard disk manufacturers set each machine to a certain number before they ship. If your Mac won't start up when you install your new scanner, it may be because the scanner has the same device number as your hard disk.

On some scanners and hard disks, the device number is easily changed with a DIP switch located on the back or inside the machine. On others, changing the device number requires special jumper wires and a trip to the computer store. Before you buy any SCSI device, find out what is involved in changing its device number. Make sure that the scanner and your hard disk have different numbers or that you can change the numbers yourself.



A



B



C



D



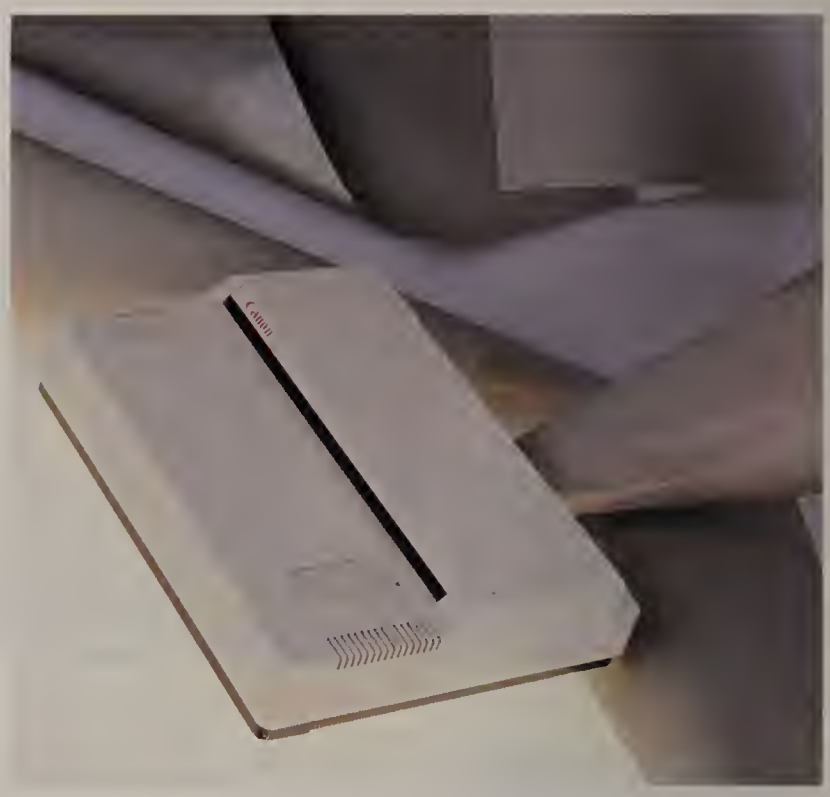
E



F

Six Scans

Different treatments of the same photograph: (A) was made with an 8-bit Datacopy scanner and printed on paper at 100 lpi by a Linotronic 300. (B) was produced with a 4-bit Abaton gray-scale machine and output by the same method as (A). Notice the pronounced banding. (C) is a conventional 100-lpi PMT. (D), the pick of the litter, was made from the same Datacopy file as (A) but was printed directly to negative at 150 lpi. This negative took a Lino 300 only 25 minutes to print. Both (E) and (F) are 50-lpi LaserWriter printouts. (E) was made from the same 4-bit file as (B); (F) is a bi-level file made by the New Image MacScan. The bi-level file looks somewhat better because it shows 36 gray levels, as opposed to the gray-scale machine's upper limit of 16 (note that most gray-scale machines offer a bi-level option for optimizing laser printouts).



New Image's MacScan interfaces enable you to use this Canon sheetfed scanner with a Mac. MacScan comes in bi-level and 8-bit models.

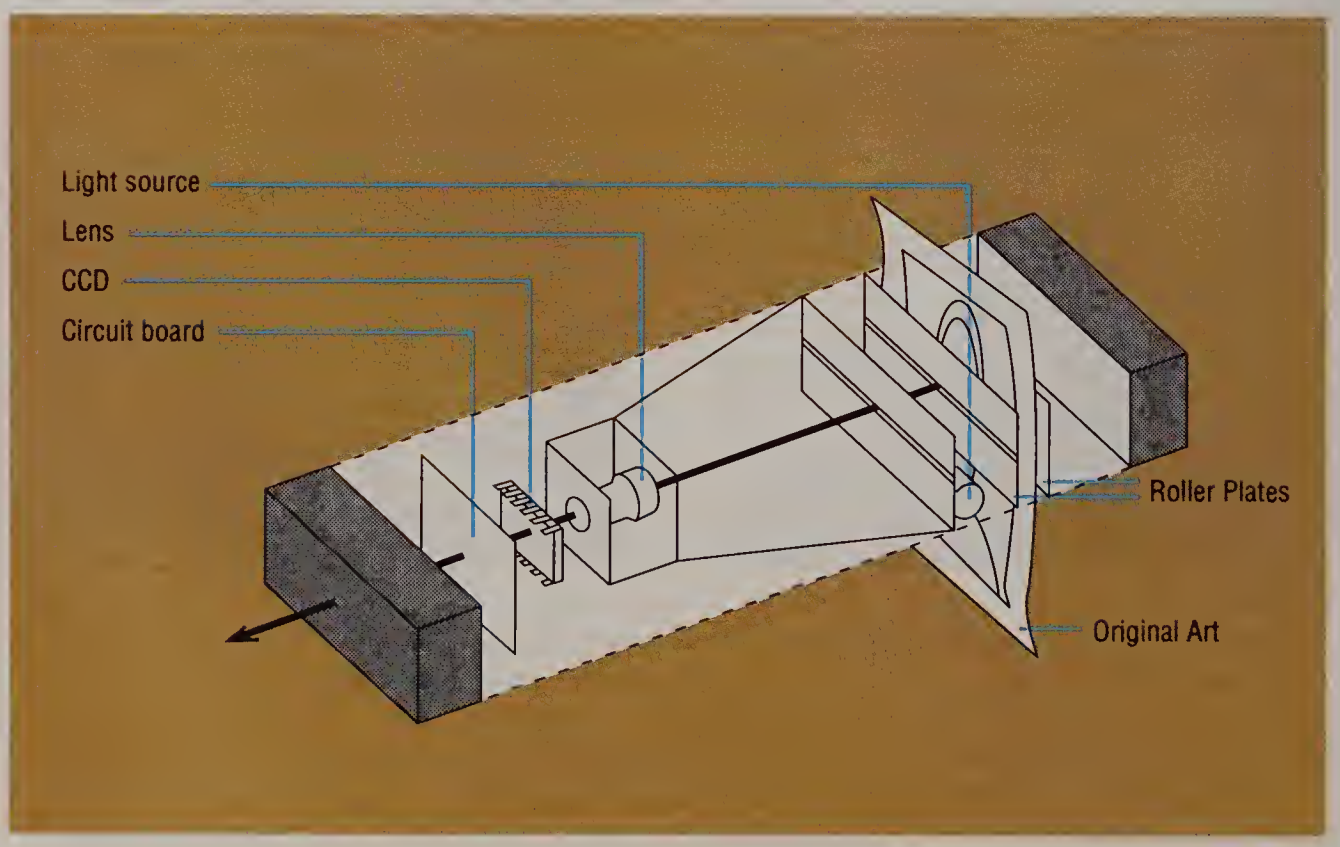
And to top it off, although Abaton offers various software options at various prices, none of these programs can open and edit a gray-scale file.

For that purpose, Abaton recommends *ImageStudio,* at a price in the $500 neighborhood. By virtue of being first, *ImageStudio* seems to have become the de facto standard for image-processing software. There are, however, other programs now entering or about to enter the market that rival *ImageStudio*'s abilities. Whatever scanner you buy, gray-scale editing and image-processing capability is something you'll want. With gray-scale software you can control the contrast of scans in tiny increments, remove blemishes and extraneous objects from pictures, adjust the halftone screen ruling, eliminate wasted file space, achieve interesting effects, and generally have a lot of fun.

For sheer control over digitized images, no program I've seen so far can match Datacopy's MacImage software version 2.0, which the company says it will ship with its $9000 Model 840 8-bit scanner. This amazing program does not offer *ImageStudio*'s pixel editing tools, but it lets you design your own gamma curves and dither-matrix patterns either by using tools in the program or by importing formula tables from *Microsoft Excel.* Of course at that price, the software had better be great.

The computer you'll be using may also determine whether, or how far, you want to plunge into the world of gray-scale art. When you open an 8-bit image file containing 256 shades of gray on a Mac Plus, what you see isn't even close to what you get. This can be a big problem when you're trying to edit images or alter the gray map. For the full effect, you'll need a Mac II and an 8-bit video card with an analog monitor—either color or black-and-white.

Since gray-scale scans can take up huge amounts of storage—not to mention the disk space required for image-processing software—don't even think about this stuff unless a hard disk is in your budget. And having enough RAM is equally important. If your scanner scans to disk, you may wind up with a file too big to



Inside a Scanner
The heart of most scanners is the charge-coupled device (CCD), which contains sensors that register light intensity. In this exploded view of a sheetfed scanner, a lens reads the artwork through a slot as the copy passes between rollers. The lens then focuses the light on the CCD.

At the Service Center

Printing out bit-mapped images on a Linotronic phototypesetter has never been fun. A bi-level bit map of a photo might take up to an hour to print, but you can measure the time it takes to print a 6MB, 8-bit gray-mapped image with a calendar. At $8 an hour plus $7.50 a sheet for phototypesetting, versus $7.50 for a photostat, the choice is obvious. The only time it becomes cost-effective to send digitized images to a phototypesetter is when they are combined with text in complete page layouts. Even then, only images with gray-level information are worth reproducing this way.

The clock starts ticking once you enter the service center and register, so make sure you waste no time getting your files printed. Whenever possible, print a copy on a laser printer first. Check it over thoroughly before sending the file to the typesetter. Images that have been cropped or resized in a page-layout program take longer to print. If a picture needs cropping, do it by saving the selected portion directly from the scanner software, or by using *ImageStudio*. The same goes for resizing. Ideally, you shouldn't make any alterations to an image once it has been placed in a page-layout document.

The best way to keep service time short is by keeping scanner files as small as possible (see the advice under the heading "Cutting Corners" in the main article). The new scanner technology can save you money, but only if you use it wisely. That means planning your scans before you make them.

call up for editing or printing. You'll want a minimum of 1MB. (*ImageStudio*'s options for reducing the resolution of a scan and opening only part of it can be helpful in this respect.)

Other hidden costs can include cables and SCSI terminators, which don't come with some scanners. Additional cables can add over $100 to your package. A SCSI terminator is a small extension plug that looks like it should cost $2.95 but actually costs about $40.

So, before buying any scanner, ask for a demonstration—if possible on a system that closely matches your own. Ask the salesperson to bring an image up on the screen and make contrast and brightness adjustments to it; this level of editing is an absolute minimum for useful operation. Find out if the software you need to make contrast and brightness changes is included in the price of the scanner. And ask about cables and terminators.

It's all right to be a pest. Next to your computer, a scanner is probably the most expensive device you'll buy. A few hours of caution will save you from regrets later.

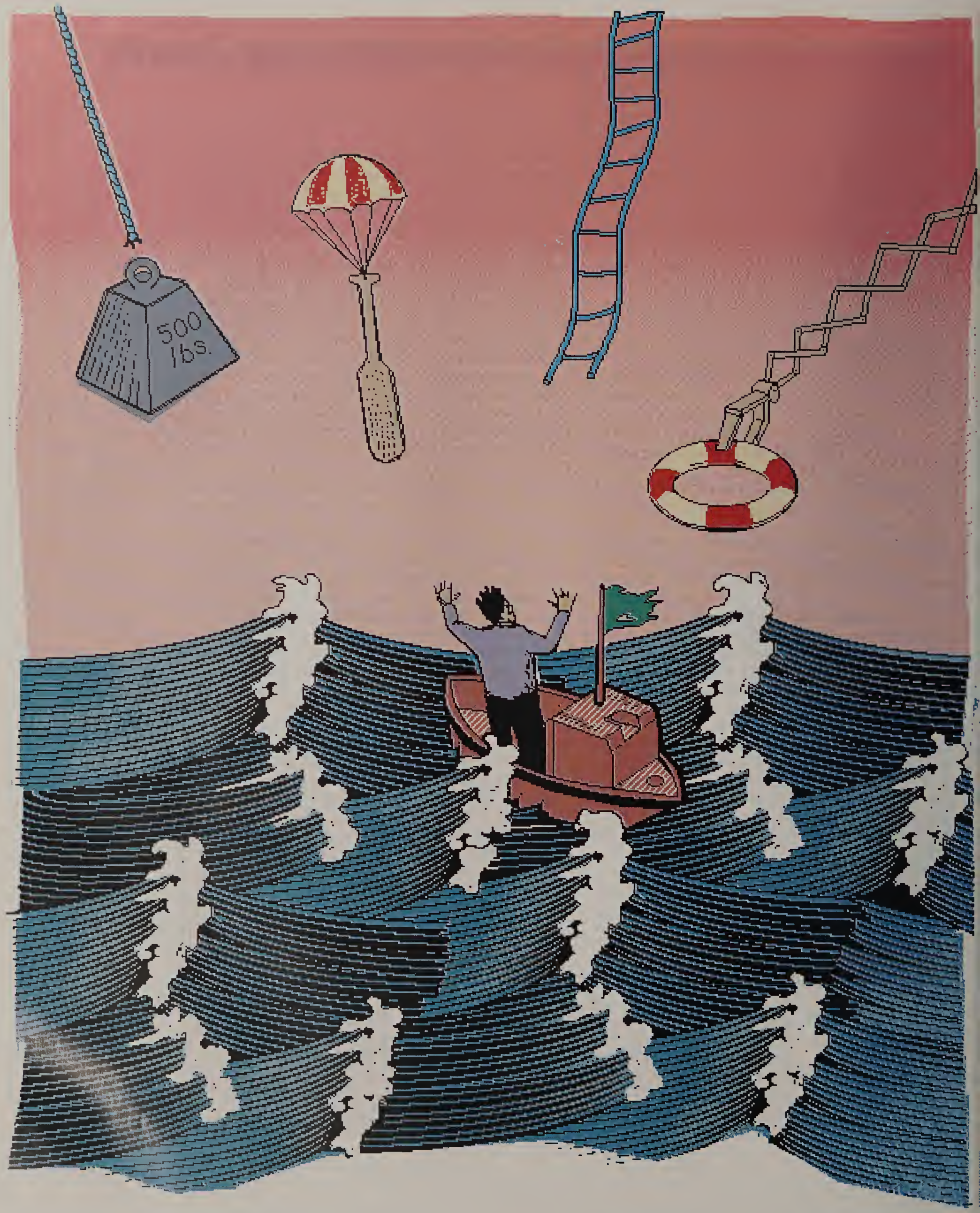
The Right Scanner

The right scanner for you depends on what you'll be doing and how much you want to spend. A scanner that saves files in TIFF is a requirement for anyone using scanned images with page-layout programs. Publishers or graphic artists who want a device that can produce PMT-quality results will need a scanner that saves at least 6 bits per sample (64 gray tones); at less than 6 bits you begin to notice banding between gray tones.

If you plan to print your scans only on a LaserWriter, you won't make any resolution or gray-level gains by moving to a gray-scale scanner; bi-level or gray-scale, the best you can get on a 300-dpi printer is 16 gray levels and 75 lpi. That's not to say that you won't benefit from having a gray-scale machine. The ability to change the appearance of an image without rescanning is a feature that can save anyone time and money.

Of course, other considerations besides the number of bits per pixel a scanner saves will influence your decision about which machine is right for you. "Scanning the Horizon" (July 1986) includes a good discussion of the other factors—such as character recognition capability or the flatbed versus sheetfed issue—that should enter into your decision. □

See *Where to Buy* for product details.


500
lbs.

HELP!

Where do you turn when your programs have problems?

by Michael Alexander

You bought a hot new $395 word processing program last month, and it's got every feature in the book. Unfortunately your programming wonder won't print correctly with your $5000 LaserWriter. The word processor's instruction book reads as if it were translated from a foreign language, so you phone your dealer. Your salesman, who said he wanted a long-term business relationship ("Just call any time you need help..."), quit last week. His replacement tries to sell you a Mac II.

Since the problem could be in the printer, you call Apple, long-distance. A voice there explains that all support is given through dealers.

Well, maybe the problem is with the word processor–your other programs print. You call the software publisher's customer support number, long-distance. After all, you're a customer and you need support. You get a busy signal for the first five tries and then, when you finally connect, a recorded voice tells you to call Technical Support. After several tries, you're put on hold. You use the 20-minute wait to browse through back issues of your computer magazines for a vaguely remembered mention of your problem. Can't find it.

When a technical support representative comes on the line, you explain the difficulty. "Oh, yeah," she says knowingly. "It's a glitch in the LaserWriter. You'll have to call Apple." Then she reminds you that the support service that came with your software expires next month. If you want continued help, you should sign up now for just $75 a year. Next month, the same coverage will be $99.95.

Have a nice day.

Help Headaches

When the Mac first came out, *MacWrite* and *MacPaint* were revolutions in user-friendliness. Both programs were easy to learn, and they worked. If you were a complete klutz, your dealer explained how to change the ruler settings. Enthusiastic industry pundits predicted computers would soon become so intuitive that documentation and software support would be unnecessary. Macintosh TV ads showed a 10-pound stack of IBM manuals crashing like bricks onto a desk, followed by the soft plop of a slim Mac manual.

Today you could flatten your mouse trying a similar stunt with Mac documentation. Some of today's Mac programs come with two- or three-volume instruction manuals, not to mention the tapes, videos, and training courses. Today's Mac is more complex, the Mac marketplace is more crowded, there's more hardware and software and more features. The Mac's success has many users pleading for help, and some are having a hard time getting it.

One reason good help is hard to find involves the dealers, who are the major support channel for most people. A recent *Macworld* survey showed that more than 40 percent of readers are dissatisfied with their dealer service. It's disillusioning to discover that the person who sold you your hardware doesn't know anything about writing macros in *Excel*.

The reasons for such ignorance are no mystery. The commission for selling a $400 spreadsheet program is a fraction of that for a $5000 Mac II, and since the amount of sales and support time can be the same, guess where the effort goes? For their part, dealers say customers' expectations are unrealistic. "I have 200 pieces of software on the shelves," says Ken Petracek, manager of the computer division of CW Electronics in Denver, "but people find it frustrating that I don't know every program in depth."

Then there's customer Ping-Pong. It happened to Terry Shelton, operations manager of a San Francisco



ROBERT HOLMGREN

HyperDrive owner Terry Shelton (now on his fourth drive) calls GCC's support nonexistent. Although he has a service contract, he has never received notice about upgrades to make the drives work with new Apple Systems.

wholesaling firm. When Shelton called General Computer about his HyperDrive hard disk, GCC told him to call his dealer (Ping!), who knew nothing (Pong!). So Terry called GCC back and sat on hold "forever." All he wanted to know was whether there was a new version of HyperDrive's system software, since his version was crashing with Apple's newest System. (There was a new version, but GCC hadn't notified its customers.) Now Shelton is broadcasting his plea for help–and his strong feelings about GCC's service–on user-group bulletin boards.

Another trend that's raising the frustration level of many users is the increasing tendency of publishers to shift the burden of software support to customers. To cut costs, many publishers are quietly converting toll-free phones to regular lines. Others are raising software prices. Borland, for example, raised the price of the new release of its *Reflex* relational database manager. It did so partly because of the upgrade's new features and partly because the average call for help lasts 20 minutes, and Borland picks up the tab.

Of course, another solution to the rising cost of help lines is simply not to increase support staffs to meet the growing number of calls, which leaves irritated customers on half-hour long-distance holds.

But the most controversial trend on the software help scene is the tendency of companies to limit the help customers get with a software purchase; after an initial period of free support, the customer is charged for services rendered. Pay services are particularly favored for very specialized programs, such as high-end accounting packages, and by big software companies that sell complex programs to corporate customers. Ashton-Tate's plan is typical. You get 90 days of unlimited (but not toll-free) help calls. After that, you choose among three contracts costing from $50 to $150 a year for a limited number of calls ($150 buys you a contract that includes 20 calls and a package of publications). Contracts for corporations can cost up to $995. As the Mac goes increasingly corporate, expect more service of this type.

Manual Labor

Then there are the instruction manuals or, as they're known in techno-jargon, *documentation.* Many talk gibberish. Can you understand the instructions on how to create style sheets in *Microsoft Word* 3.0? Can you decipher runes?

Other manuals talk down. The 185-page instruction book for *MicroPhone,* a relatively easy-to-use communications program, begins by assuming you know how to work a Mac. Forty-six pages later, it still explains dialog-box choices like this: "Move the mouse pointer over the round button labeled with the Baud rate you wish to change to. Click the mouse button and the on-screen button that you have chosen will highlight." In other words, click on the baud rate you want. After wading through the manual, written in 1985, you can check the addendum, written in June 1987, to find what has changed in the procedure you just learned. Then you can check the Read Me First! document on *MicroPhone*'s disk for last-minute alterations to the changes.

Perhaps that illustrates the central problem of the help conundrum–there's no central source. You ricochet from manual to dealer to publisher, frustrated and angry as you fritter away the time that computers are



supposed to save. And even if you do find your answer quickly 80 or 90 percent of the time, the bad experiences are the ones you remember.

Corporate Solution

Some large companies have recognized the inefficiency of individual employees' calling software publishers or dealers for help. One such company, Seattle's Seafirst Bank, set up an information system that offers the users of its 2600 Macs a variety of help options.

Seafirst employees receive basic computer training and courses on software programs from an information center officially called Professional Electronic Tools but nicknamed The Pet Shop. For phone help, workers can call a help line staffed by 13 specialists

who handle a staggering 500 calls a day–11,000 per month. Face-to-face assistance with complex problems comes from a small group of experts at the resource center.

But Seafirst's innovation is 130 employees who, in addition to their regular jobs, act as "paratrainers." Diane Wood took an introductory paratrainer class at the Pet Shop, followed by courses in specific Mac programs. Now she helps all the computer users on her floor. Fellow paratrainer Gail Gautestad observes that the paratrainers are effective partly because "we're still basically end users–not high-techies."

Some corporations buy training-and-support contracts from the dealers or consultants who supply them with hardware and software. Training programs, which cost from $150 to $350 per day for each employee, can be a very lucrative sideline for their providers. Students, however, sometimes complain that the courses are little more than walk-throughs of the training manual.

Another solution for corporations is third-party help. A San Francisco firm called Computer Hand Holding supports the Mac's top ten business products. According to president Emil Flock, the firm seeks business primarily from medium-size and large corporations that need high-volume help, don't want to staff a support department, or need to ease demands on their own information centers.

What does such service cost? A typical one-year contract provides 40 hours a week of telephone help, administration, and reporting for $2500 a month. Additional time is $50 an hour.



Getting What You Need

Even if you don't have an information center to draw upon, help could be closer than you think. In addition to checking the manual or calling the help line, consider the following often-overlooked resources.

■ It may seem obvious, but since you're already at your Macintosh, check your program's help screens. Sometimes they're clearer and better organized than the printed manuals. Some may even have more information: Apple says the on-screen help for *HyperCard* is more complete than the (excellent) manual. *PageMaker* 2.0 uses an innovative on-screen hypertext help program.

■ Seek out local experts. You can often find an associate or friend who is experienced with a given program. Many nonprofessional experts enjoy being asked to solve challenging problems.

■ Your local Macintosh user group can be a wonderful source of expertise. Group bulletin boards are electronic extensions of local experts. The only disadvantage is that bulletin boards are often small operations whose lines are frequently busy. To find the user group nearest you, call Apple at 800/538-9696, ext. 500.

■ Specialized bulletin boards offered by CompuServe, GEnie, and The Source network services let you reach out and ask the computer nation for help. Queries to these BBSs can easily generate a dozen responses. Simply browsing through the correspondence can tip you off to bugs and fixes, compatibility problems, and other headaches. Smart software companies monitor these boards, announcing problems and fixes they've found and learning of new ones. Smarter companies–Living Videotext, Borland, Microsoft, Adobe, and Aldus–maintain forums of their own on the networks.

■ Build a reference library of magazines and books that address programs you use frequently. Mark tips with highlighter pens and flag useful stories. (To make it easier to locate past articles, *Macworld* is working to put its indexes into *HyperCard* stacks. Watch for details as they develop.)

Calling the Company

Of course, you will want to call the software publisher. Prepare your questions first, and be ready with basic information such as your Mac's model and serial numbers, software version numbers, and so on (see "Before You Become a Bug"). Publishers legitimately complain about lazy callers. Layered's vice president of marketing, David O'Connor, reports that more than half the calls his company receives are on topics covered in the documentation (and half of those aren't



DAN ESCOBAR

Seafirst Bank has created a variety of in-house resources to support its 2600 Mac users. Paratrainer Diane Wood (left) helps coworkers in addition to her normal job. June Honeycutt is a full-time trainer.

about *Insight* at all, but about Mac procedures like copying files). Acius president Guy Kawasaki says the reason his company doesn't have toll-free help lines is that "customers then call without even trying to read the manual."

The type of service you receive, once you get through to a software publisher, can vary considerably (see "Help Policies"). When phone lines get jammed, most publishers believe it's in the customers' interest to take their numbers and call them back, rather than keep them on hold. Charles Jackson, president of Silicon Beach Software, wants his tech support department to be able to answer all calls immediately. "No one ever talks about our tech support," says Jackson, "because it's so good. When we got to the point recently where we were having to return 12 calls a week, I added staff." According to tech support manager Mari Hughes, the department has now reduced the number of calls it returns each week to about 5, and she emphasizes that they're made "within five or ten minutes" of each incoming call.

Ironically Aldus, which has a good reputation, just moved to a hold system to improve service. "When customers call," says customer service manager Colleen Byrum, "it's because they're in trouble now, not one or two hours later when we call back." By increasing phone staff 40 percent, Byrum hopes to keep the maximum hold to about four minutes.

On the other hand, Microsoft's phone support has always drawn a lot of fire. The software giant's 20 Mac specialists get about 700 calls a day—that's 35 apiece each day. By way of comparison (although direct comparisons between companies are a little tricky), each member of the tiny Silicon Beach tech staff averages about 19 calls per day. One improvement Microsoft has



DAN ESCOBAR

Aldus technical support manager Ben Bauermeister lugs a stack of completed call reports. The 15 tech support reps take some 500 calls a day (the entire support department numbers about 31).



added is a computerized phone system that asks you to enter touch-tone numbers and then directs you to a Mac specialist. If you're using a dial phone, however, you still must wait for an operator.

When you call Microsoft, be sure to dial the number on the stub of your registration card, which, if you're lucky, you've kept with the instruction manual. Even though you may feel that it's you, not your software, who needs a little service, when you call Customer Service you'll discover you've dialed the wrong number; the help line you want is Product Support. (This departmental distinction may be clear to publishers but it's confusing to customers: generally, Technical Service or Product Support handles help questions; Customer Service tends to be a marketing arm that deals with registration, upgrades, and the like.)

Registered users of Aldus's *PageMaker* get 45 days of help (not toll-free) from the time of their first phone call, along with a guide to basic page design and a bimonthly newsletter. After that, you can buy a service contract for $100 a year, which provides five hours of toll-free help, big discounts on new program versions, and other benefits.

Apple

The consensus among Mac users is that Apple's software help has been awful. Call Apple, and you're referred to your dealer. Good luck. Now Apple has created a new company, Claris, to sell its existing applications software and to market new programs. (Apple will retain the Mac's System software and *HyperCard.*)

John Zeisler, vice president of marketing, says Claris is going to give better service than its parent. That means "great telephone support," new ways to sample software before buying it, and a variety of ways to reach users with help. The specifics are still being worked out, Zeisler says, but the perspective is different. "We want to be closer to the customer. If customer support is being asked the same question ten times a day, we'll rewrite the manual. If that doesn't solve it, we'll push the problem up to engineering, and make the program easier."

Apple has recently formed something called the Apple Training Alliance. The Alliance is writing curricula for training companies and dealers, and the first curriculum is for desktop publishing. It teaches the use of *PageMaker, Word, PowerPoint, Illustrator,* and *SuperPaint*.

The emphasis here is on the big-bucks training market, not the cash drain of consumer help. But one of Apple's qualification standards for the program is that people who take a Training Alliance course must

Board Games

Michael R. Hoffmann's law firm in Des Moines owns eight Macintoshes. Six have never needed repairs. But two Mac 512Ks have burned up five power supplies between them. After reading in *Macworld* that others have had similar experiences, Hoffmann decided he might not just be having bad luck.

Smoke Gets in Your Eyes

Inside the Mac are two electronic boards. The system board lies flat on the machine's bottom and performs computations. The analog board is mounted vertically on the Mac's left side and includes the power supply, the video sweep circuitry, and the loudspeaker. The Mac is generally a reliable machine, but the analog board has been a continuing source of trouble and controversy.

When an analog board blows, your Apple dealer swaps the smoking relic for another board, then usually tells you (as did Hoffmann's dealer) that the problem was the power supply. Perhaps as a result there is a widespread belief that the Mac 128K, 512K, and 512KE power supplies are too small.

But John Sawyer, partner and chief technician of CJS Systems in Berkeley, California–a Mac-techie heaven that does upgrades and repairs–says the Mac isn't underpowered. In fact, the problem could be nearly anything on the analog board. Most of the time, Sawyer says, the culprit is the flyback transformer–part of the video circuit. As proof, he points to a box of several hundred failed units. Sawyer says Apple substituted a beefier flyback transformer in the Mac Plus and SE and in late 512KEs, and he's seen very few analog-board problems in those models.



DAN ESCOBAR

John Sawyer of CJS Systems contemplates his collection of failed flyback transformers–the real culprits in many so-called power supply failures.

But that hasn't fixed Michael Hoffmann's flaming 512Ks (which, according to Hoffmann, actually just "smoked a lot"). In June he complained to Apple, asking for reimbursement for the bad boards he's replaced and either a permanent fix, replacement Macs, or a refund of the machines' fair market value (about $1,100 each). In September, Apple offered new boards and a free one-year service contract. Hoffman thinks Apple's offer suggests it hasn't solved the underlying problem. When this article went to press, he'd counteroffered: Hoffman was willing to settle if Apple reimbursed him $589.68 for his repair bills and covered the new boards' installation charges.

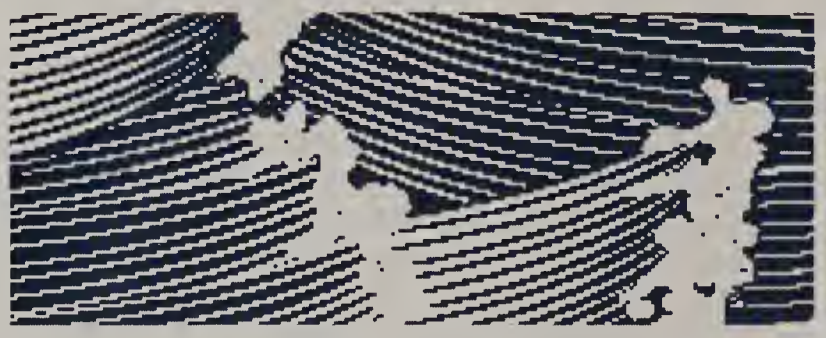
Repair, Replace, or Rip-off

If your Mac's out of warranty and an electronic component does fail, you can replace just the component or you can replace the entire board. Apple wants dealers just to swap boards, which doesn't require as much technical talent as repairing them. As a result, you can save money if you can find a good shop to do the repairs. CJS charges $108 to replace the flyback transformer and associated parts. But how much you save depends on what your local authorized Apple dealer charges. A random phone survey of dealerships nationwide brought in quotes from a low of $143 to a high of $268 for installing a new board.

be offered follow-up help, though it's not likely to be free, nor to last forever.

Know Your Rights

What should you expect when you buy software? The following software bill of rights is based on numerous conversations with both users and publishers. We're talking common sense and good business prac-



tices here, not the law, which lags far behind this fast-moving industry.

■ The program should work. No program is completely bug-free, particularly when first released. But, says Daniel Chayfetz of Odesta, maker of *Helix,* "When users pay hundreds of dollars for a product and then find hundreds of bugs, they're paying to be beta test sites." Many users felt that way after they bought *Microsoft Word* 3.0. Bulletin boards crawled with reports of more than 400 bugs by the time Microsoft rushed a free upgrade.

■ The program should fulfill its advertised promises. *Insight,* Layered's excellent accounting package, advertised that it would show dollar amounts to five decimal places. That capability was important to Steven Pinsky, owner of SRO, a film- and video-sound service in San Francisco; Pinsky might bill a customer $0.0655 per foot of magnetic film. But *Insight*'s first release showed amounts to only two decimals, falling somewhat short of the billing accuracy SRO needed and expected. Layered helped Pinsky work around the problem, but *Insight*'s deficiency burdened SRO, and Pinsky thinks Layered should have offered a partial refund or credit.

The new *Insight* release shows dollar amounts to five decimal places, and has been offered (for $15) to all registered users, but it took Layered 14 months to correct the problem. "A handful" of buyers got their money back, according to Layered's David O'Connor, but he concedes that customers like Pinsky who were inconvenienced got no breaks. He points out that all customers have received free help since July 1986, though Layered hasn't publicized the fact. Pinsky says Layered's help has been top-notch. But he notes that a mailing-label feature also promised originally still isn't in the new release.

Help Policies

Publisher	Time limit on help	Phone hours	Holds or calls back	Newsletter	Bulletin board forums	Tech sheets	Large-user specialist
Aldus	45 days*	7-6 PST	holds	yes	CompuServe	yes	yes
Ann Arbor Softworks	unlimited	9-5 PST	calls back			yes	yes
Apple	*	n/a	n/a				
Blyth	60 days*	8-5 PST	calls back	yes		in newsletter	yes
Borland	unlimited*	8-5 PST	calls back		CompuServe		
Centram	unlimited*	8-5 PST	calls back	yes		yes	
Cricket	unlimited	9-5 EST	calls back	yes		yes	
IDD	unlimited	8-5 PST	calls back				
Living Videotext	unlimited	9-5 PST	calls back		CompuServe		
Microsoft	unlimited	6-6 PST	holds	yes	CompuServe, The Source		
Odesta	unlimited	8-6 CST	calls back			yes	yes
Silicon Beach	unlimited	8-5 PST	calls back		BIX		

*See Comments.

Support policies of 12 representative software publishers. The information in this table reflects policies in force at press time.

Before You Become a Bug

About to call a software publisher for help? *Macworld* based this phone-support checklist on suggestions from Colleen Byrum, manager of customer service at Aldus. Follow it for faster answers and lower phone charges when you call a publisher.

■ Register your purchase. Amazingly, only 30 to 60 percent of software buyers send in their registration cards. Most publishers won't answer your questions if you're not on file.

■ At least try to read the manual. If it isn't clear, let the company know that's why you had to call for help.

■ Try to identify the problem's source. If you've been found by a bug, immediately write down what sequence of events led to the crash. If the problem is a new one, did you do something you'd never done before? If you repeat your actions, does the problem occur again? Are you having strange problems with other programs, or just with one? "Mac Troubleshooting Tools" in the April 1987 *Macworld* outlines basic procedures for analyzing whether your difficulty comes from system or hardware problems, or from a glitch in the software.

■ Have the numbers ready. Most phone techies will want you to provide the serial number of the program and the service contract number if you have one. Other information you're likely to be asked for includes your Mac's model; the amount of RAM installed; the names of any upgrade boards; and the version number of the System, the Finder, and the program you're using.

If you're on a network, they'll also want the name of the file server and the version number of its System software, the number of users on the network, and whether users share a System file or have their own.

Comments
45-day help limit begins with first call; toll-free phone number; one-year single-user service contract, $100.
Apple recommends contacting dealer.
60-day help limit begins with registration; one-year single-user service contract, $95-$195.
Toll-free phone number.
Centram says it will soon be selling limited, single-user service contracts.

■ The program should have clear and complete instruction manuals.

■ The program should be intuitive. You have a right to expect things to work the way you expect them to work.

■ Fast and frequent information. Publishers should try new ways to get new information to you: bulletin boards, newsletters, tip and tech sheets, upgrade notices. How easily you get phone help tells you a lot about the publisher's commitment to its product and customers.

■ If you're a registered owner, the publisher should notify you by mail about program upgrades and offer you substantial discounts on revisions that include major changes and improved features. Upgrades that primarily fix bugs should be sent free.

■ No buck-passing. If you're using a reasonably standard combination of software and hardware, a call for help to one company should get you a solution, not a referral. It's the developers' responsibility, not yours, to make their products work together. □

See *Where to Buy* for product details.

The Ethernet Solution

Ethernet brings high performance to Macintosh networks

Until recently, if you wanted to network Macintoshes, AppleTalk was the only solution. Of course you could purchase alternative cabling systems, such as Farallon's PhoneNet, but regardless of the cable you chose, the 230K bits-per-second speed limitation remained. Because AppleTalk is a network architecture–not just the connector boxes and cables attached to the Mac–Apple was able to develop EtherTalk, a speedier yet compatible alternative to the original AppleTalk network (now dubbed the AppleTalk Personal Network). EtherTalk, based on standard Ethernet cabling, maintains compatibility with existing AppleTalk software and offers networkers a much higher performance alternative.

Originally designed at Xerox in 1976, Ethernet is a high-speed communications medium that allows information to travel over the network at up to 10 megabits per second. Because Ethernet is also a standard adopted by the Institute of Electrical and Electronic Engineers (IEEE), almost every computer–now including the Mac–has access to Ethernet. This includes the supercomputers from Cray, the VAX from Digital Equipment Corporation, the IBM PC, and UNIX workstations, such as those from Sun Microsystems and Apollo Computer.

Like the AppleTalk Personal Network, in its simplest form Ethernet is configured as a bus–a single ca-

ble open on both ends–as opposed to a ring or loop system. Conceptually, an Ethernet network looks something like a tree, whose limbs are nodes (individual computers) and whose trunk is the Ethernet cable.

Installation of cable is usually the most costly part of setting up a network. Ethernet provides several wiring schemes that span a range of price and performance (see "Choosing Your Cable").

The physical connection to the Ethernet cable is made by a connector, or *tap*. Different types of cable use different types of taps. A tap connects to an Ethernet transceiver, which handles the receiving and sending of information over the cable. Finally, the computer-resident Ethernet controller is reponsible for assembling and disassembling data into packets so the Mac can transmit and receive information across the network.

Network Configurations

One way to use Ethernet is as a local area network (LAN). This connects every Mac in a work group with Ethernet cable. For example, an engineering work group may need to access and share very large CAD files on a network file server, or perhaps several users need to access one large database. Using Ethernet speeds up the network for such applications.

If the problem is not to get information to and from group members, but rather to get information to and from different work groups altogether, an Ethernet *backbone* (a central thoroughfare with tributary networks) may be the logical solution. This configuration fills the bill for departmental communications networking. For example, an Ethernet backbone might link separate AppleTalk work groups, themselves connected with twisted-pair wire, PhoneNet, or even Du Pont's fiber-optic AppleTalk. If you already have AppleTalk networks, there's no need to rewire them for an Ethernet backbone.

Because Ethernet is a *multiple-protocol medium,* several networking protocols–for example AppleTalk, DECnet, and TCP/IP–can run on it simultaneously. This capability lets you to create a corporate networking



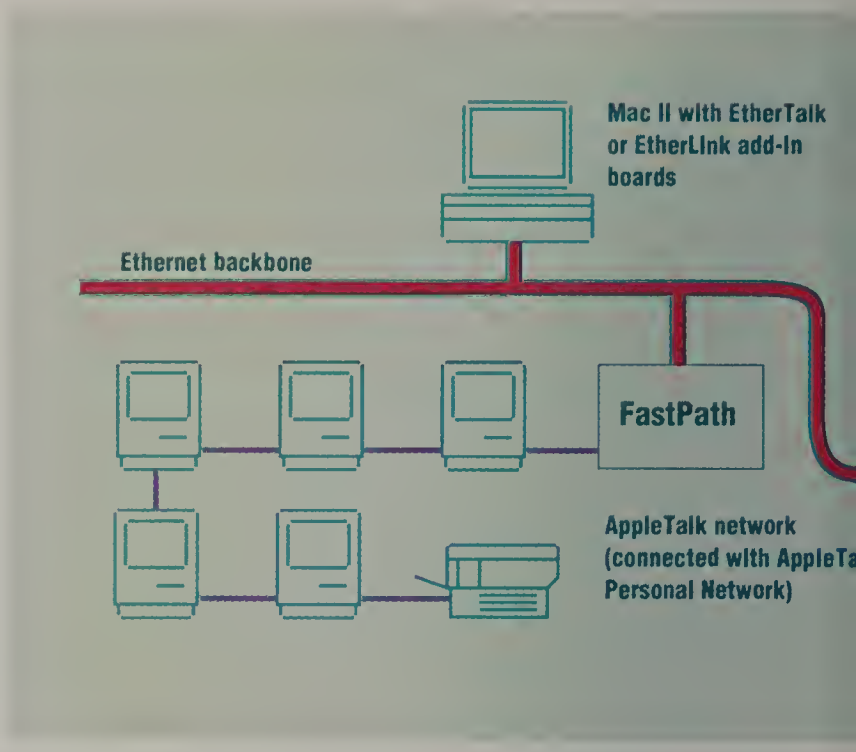
scheme, connecting all types of computers, without having to install different cables for each type of network connection—or worse, having to rewire a previously established network.

Name Your Protocol

Software protocols are necessary to run network services, such as E-mail and file servers, and also to guarantee reliable transmission and reception of data over the network. Even the AppleTalk Personal Network cable is useless without the AppleTalk protocols, the set of rules that govern communication over the twisted-pair wire. The same is true for Ethernet. Once you've connected the Macs with Ethernet cable, you still need the network protocols to communicate via Ethernet.

A full-fledged network requires an entire suite of protocols. Each protocol in the suite has various responsibilities. To help organize the protocols, the International Standard Organization (ISO) has developed a networking reference model that makes it easier for companies to ensure that different computers can talk to each other. The AppleTalk network architecture is a complete implementation of the ISO reference model.

The Ethernet standard is an integral part of the ISO model. Consequently, many different networking protocols can run over Ethernet. Because different computers use different protocols, the type of protocol



your network needs depends on the type of computer (or computers) you will connect to your Mac.

EtherTalk

Apple's EtherTalk is a high-speed alternative to the AppleTalk Personal Network. EtherTalk lets you run AppleTalk protocols directly over Ethernet, rather than over the traditional twisted-pair wire. Thus, AppleTalk networks take advantage of Ethernet's speed and capacity. A single EtherTalk network can include up to 254 nodes and 1000 meters of cabling.

EtherTalk and the AppleTalk Personal Network use the same upper-level protocols—for example, the AppleTalk Filing Protocol (AFP). As a result, most application software runs with both AppleTalk architecture implementations, regardless of the type of cable that connects the network's computers.

DECnet

Digital Equipment Corporation has its own networking/communications framework called Digital Network Architecture (DNA). DECnet is the name given to the set of software protocols necessary to adhere to DNA. The primary communications medium used for DECnet is Ethernet cable.

DECnet is similar to the AppleTalk architecture. It has its own complete suite of protocols for everything from E-mail to file directories. Both DECnet and AppleTalk are protocols for specific computer families, developed by the computer system vendors. Both protocols offer high-level network services such as file sharing and E-mail. If your Mac has access to DECnet protocols, you can take advantage of the services the DEC environment offers.

TCP/IP

TCP/IP (Transmission Control Protocol/Internet Protocol) is a set of protocols used to transfer data on Ethernet. Developed by the United States Department of Defense, TCP/IP is a de facto industry standard for communications between different computer systems.



Steve Nelson (foreground), vice president of marketing for Kinetics, and Subhash Bal, Excelan's vice president of marketing. Excelan's acquisition of Kinetics now links the Mac to Excelan's existing TCP/IP product line.

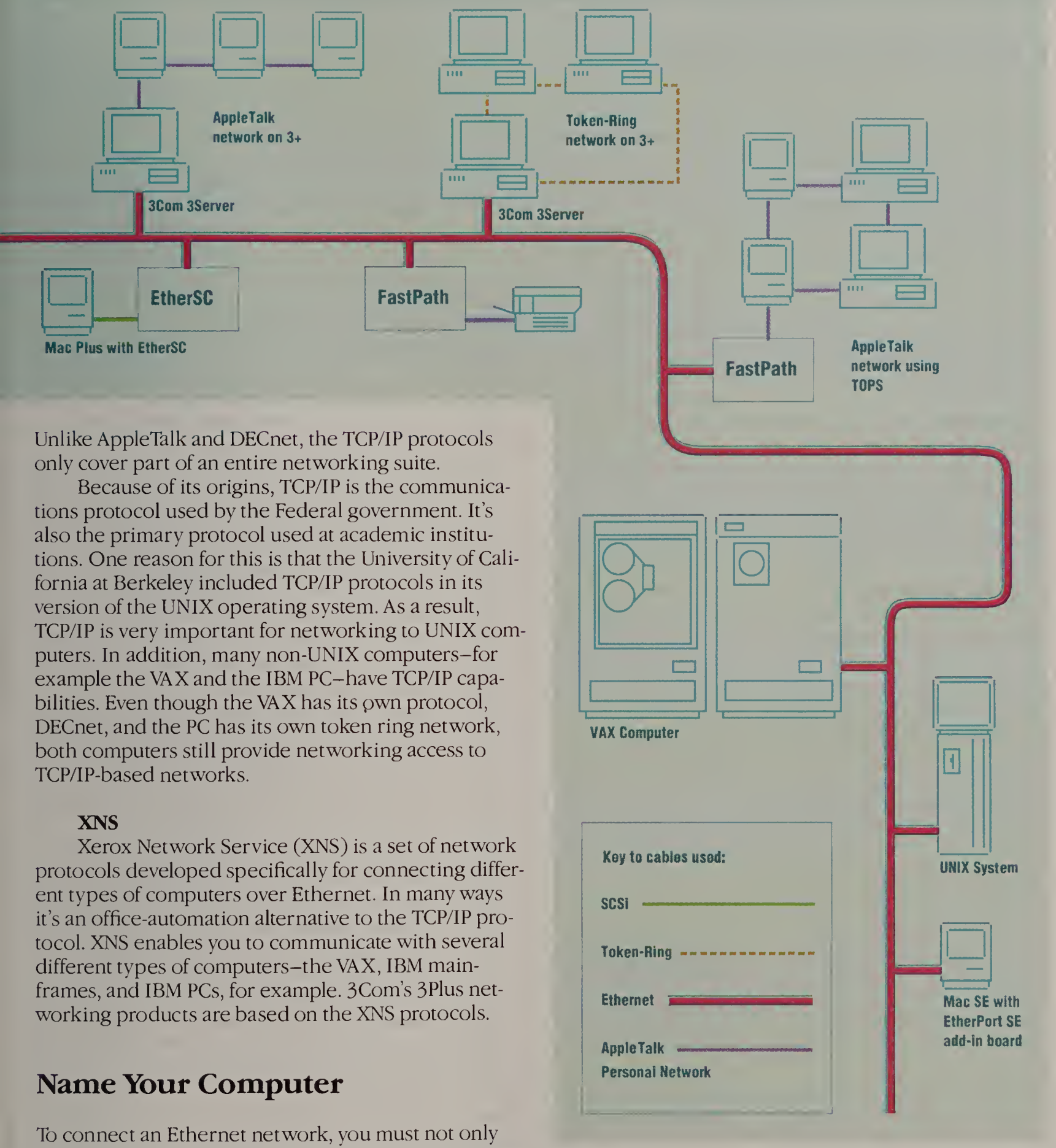


Figure 1
Individual Macs as well as entire AppleTalk-based workgroups can communicate with one another and with larger VAX and UNIX-based systems over an Ethernet backbone.

Unlike AppleTalk and DECnet, the TCP/IP protocols only cover part of an entire networking suite.

Because of its origins, TCP/IP is the communications protocol used by the Federal government. It's also the primary protocol used at academic institutions. One reason for this is that the University of California at Berkeley included TCP/IP protocols in its version of the UNIX operating system. As a result, TCP/IP is very important for networking to UNIX computers. In addition, many non-UNIX computers–for example the VAX and the IBM PC–have TCP/IP capabilities. Even though the VAX has its own protocol, DECnet, and the PC has its own token ring network, both computers still provide networking access to TCP/IP-based networks.

XNS

Xerox Network Service (XNS) is a set of network protocols developed specifically for connecting different types of computers over Ethernet. In many ways it's an office-automation alternative to the TCP/IP protocol. XNS enables you to communicate with several different types of computers–the VAX, IBM mainframes, and IBM PCs, for example. 3Com's 3Plus networking products are based on the XNS protocols.

Name Your Computer

To connect an Ethernet network, you must not only have the proper Ethernet hardware for each computer but also the software drivers that implement the specific protocols. In some cases, the hardware comes complete with the software drivers. In others, mixing and matching hardware and software from various communications vendors is necessary.

Mac-to-Mac

To implement EtherTalk, you need a hardware Ethernet controller for each Mac and the AppleTalk protocol software support for the Ethernet controller. The networking protocols for EtherTalk and AppleTalk

Choosing Your Cable

While coaxial cable is the primary physical medium for Ethernet, two other options, fiber-optic cable and twisted-pair wire, are also available. The type of cable, or combination of cables, you choose depends on your budget, performance, the distance between your stations, and the environmental requirements of your network.

Thick Ethernet Thick coaxial cable is the older IEEE medium for Ethernet. This cable measures a little less than ½ inch in diameter and can extend almost 2 miles without signal degradation. Because of its size, thick Ethernet cable can be difficult to install inside a building. (It's very awkward to run something ½-inch thick through ceiling conduits.) Consequently, thick Ethernet is usually run between buildings as a backbone to connect work groups. The thick cable's low signal loss makes it a good choice for connecting networks over long distances. However, its low signal loss also makes thick coaxial cable relatively expensive. It is not very practical for interconnecting individual computers because of the added expense for external transceivers and the rather unwieldy size and inflexibility of the cable itself.

Thin Ethernet The predominant type of Ethernet cable now being installed is thin coaxial cable. Thin Ethernet is a compromise between cost and the distance the cable can span without signal degradation. Thin Ethernet cable is about one-quarter the price of thick Ethernet. The cable itself is about 3⁄16 inch in diameter—much like the cable that runs from a television cable box. T taps, which connect a computer to thin coaxial Ethernet, are more accessible and easier to locate than the external transceivers necessary for attaching thick coax Ethernet.

Fiber-Optic For a long time, fiber-optic cable has been suggested as a replacement for coaxial cable systems. And with prices dropping, it's becoming a more cost-effective solution for some types of networks.

Fiber-optic cable has a greater range than coax—up to 2½ miles. It's immune to electromagnetic and radio-frequency interference (EMI/RFI), thus reducing noise-induced network errors. This last quality makes installation of fiber-optic cable appropriate in EMI/RFI-susceptible areas (on factory floors, for example). Fiber-optic cable cannot be short-circuited, so you can install it under water or in locations susceptible to flooding. Fiber-optic networks are also difficult to tap into illegally, making them more secure than coaxial networks.

Physically, fiber-optic cable is smaller, lighter, more flexible, and more elastic than coaxial cable. These properties simplify cable handling and installation. While the cable itself may cost more, it may be less expensive to install and maintain than conventional coaxial cable. One company making fiber-optic connections for Ethernet is Codenoll Technology Corporation of Yonkers, New York.

Telephone Wire You can now run Ethernet over existing telephone wire. 3Com's PairTamer is an adapter that lets you install standard Ethernet on an unused pair in a typical telephone wiring bundle. Like Farallon Computing's PhoneNet, the adapter takes the place of the standard modular phone outlet. Ethernet and a voice telephone line can coexist on PairTamer. Depending on the number of pairs in the phone wire bundle, you can also have simultaneous access to AppleTalk.

A short piece of thin coaxial cable (called a *drop cable*) runs from PairTamer to each computer. You must have a PairTamer on the other end of the Ethernet telephone line for a good signal. To configure an Ethernet network, 3Com provides MultiConnect, which acts like the phone closet for PhoneNet. MultiConnect lets you mix and match thin coaxial, fiber-optic, and twisted-pair cabling lines.

are the same. Any other AppleTalk network device, such as a LaserWriter, also needs access to the Ethernet cable.

Developed jointly by Apple and 3Com, the EtherTalk Interface Card is a Mac II add-in board that offers direct access to Ethernet. 3Com also plans to sell its own version of the Mac II EtherTalk card, which it will call EtherLink. The Apple and 3Com boards will be exactly the same. The EtherPort SE board from Kinetics provides the Mac SE with an Ethernet connection. All three boards allow you to use either thick or thin coaxial cable.

Also from Kinetics, EtherSC uses any Mac SCSI connector to hook into an Ethernet network. And to

connect a LaserWriter, you'll need an AppleTalk-to-Ethernet gateway, such as Kinetics' FastPath. FastPath has one AppleTalk and one Ethernet connector. So if you want to configure a local EtherTalk network, simply use the FastPath to connect a LaserWriter or any other AppleTalk device that does not have Ethernet access.

FastPath also allows you to connect entire AppleTalk networks to an Ethernet backbone. These workgroup networks can be linked either with traditional twisted-pair wire (AppleTalk Personal Network) or with PhoneNet.

The EtherTalk Interface Card, EtherLink, EtherPort SE, EtherSC, and FastPath are all configured to allow true Mac AppleTalk software to use Ethernet transparently. Since EtherTalk is really AppleTalk, you can still use all your present AppleTalk-based applications, such as E-mail and file servers.

Non-Apple Machines

Because of standardization, Ethernet is a good way to network the Mac to other types of computers. There are two ways to provide communications software compatibility between the Mac and other machines. One method is to implement AppleTalk protocols on the "foreign" computer. By putting AppleTalk protocols on other machines, you maintain the Mac interface over the network. For example, you can run AppleShare using a VAX as a file server—or use a VAX as a print queue for a LaserWriter.

The second method of implementing protocol compatibility puts other non-AppleTalk protocols, say DECnet or TCP/IP, on the Mac. In some cases, the protocol software, or *driver,* is sold separately; in others, the driver for a particular protocol comes with the Ethernet controller.

PCs and the Mac

Three PC-Mac network solutions use the AppleTalk protocols, with AppleTalk running on the PC. However, none of the manufacturers currently offers a PC Ethernet board for the EtherTalk protocols.

Apple's *AppleShare PC* requires the AppleTalk PC card for the IBM. At present this card does not offer an Ethernet connection. While Apple did design the AppleTalk PC card, it has no plans to design the hardware for a PC Ethernet controller with AppleTalk protocols. Such a board will have to come from a third-party developer. Although numerous Ethernet controllers are offered for the PC, none currently implement the AppleTalk protocols.

TOPS is working on a solution for *TOPS PC* access to EtherTalk. Its TOPS Interface Card currently works only with the AppleTalk Personal Network twisted-pair wire. In addition, Tangent Technologies is rewriting its *PC MacBridge/AFP* software so that IBM PCs can access the *AppleShare* file server with EtherTalk. The company is talking to several PC Ethernet board manufacturers about combining its software with PC Ethernet boards.

3Com uses the XNS protocols, instead of the AppleTalk protocols, to enable file sharing between PCs and Macs. In this case, the 3Server3 hardware is the gateway between the PCs and the Mac. The 3Server3—actually a PC using a 3Com-modified version of MS-DOS for a network operating system—not only routes XNS packets from the Mac to the PC, and vice versa, but is also a file server. Each server can support two networks simultaneously.

Right now 3Com's *3+* software supports three types of networks with XNS: AppleTalk, Ethernet, and Token-Ring. There is no direct connection for AppleTalk to Token-Ring currently, although 3Com does expect to release one in early 1988. Consequently, these two local area networks must use Ethernet to talk to each other.

In such a setup one 3Server3 is configured as a Token-Ring/Ethernet server; another as an AppleTalk/Ethernet server. By connecting the two servers with Ethernet, you can network the two different network types. XNS is the intermediary protocol between the two. 3Com is now implementing the EtherTalk version of XNS translation software so that you will be able to network the Mac SE and Mac II directly into the 3Server3 over Ethernet. You can use either the EtherLink or EtherPort SE controllers for the Mac. At this time 3Com has no plans to support a SCSI-to-Ethernet connection.

Another way to connect the Mac to the PC via Ethernet link is by using a foreign protocol, namely TCP/IP, on both machines. There are several vendors of TCP/IP and Ethernet controllers for the PC. PC Excelan

ISO Networking Reference Model

Application	Defines network applications available to user
Presentation	Translates format amd syntax of data for interchange across different computers
Session	Allocates host resources; handles sign-on and authentication of client; allows reference of devices by name rather than network address
Transport	Defines addressing and connection protocols for physical devices on network; guarantees message delivery
Network	Defines routing and relaying of message packets between networks; defines protocols for sending status messages to networked computers
Data Link	Defines protocols to access network for message transmission and reception; establishes shared use of physical media
Physical	Defines electrical and mechanical characteristics of physical connection; defines topology of network

Hardware layer — Subnet level

of San Jose, California, Bridge Communications of Mountain View, California, and Micom-Interlan of Boxborough, Massachusetts are examples of companies that provide Ethernet controllers and TCP/IP protocol support for the PC.

On the Mac side, Pacer offers a version of its *pcLink* software for TCP/IP protocols. *pcLink* provides terminal-emulation and disk-server functions over Ethernet, via Kinetics' Ethernet controllers.

Computers from DEC

Two products run AppleTalk protocols over Ethernet (or EtherTalk) to network the Mac with the VAX. AlisaTalk, from Alisa Systems, enables the Mac to access services on the VAX computer via FastPath. Pacer Software's AppleTalk version of *pcLink* also implements AppleTalk protocols over Ethernet, giving Macs access to VAX computers for terminal emulation and disk sharing.

Based on Ethernet, DECnet networking protocols are available on the Mac from two double-vendor teams. Alisa Systems and Thursby Software Systems provide DECnet for the Mac. This networking package, called TSSnet, supports DECnet over Ethernet or asynchronous RS-232 lines. Ethernet access is via Kinetics' EtherSC or EtherPort SE controllers, which are also supplied by Alisa.

TSSnet attaches the Mac to DECnet so that the Mac looks exactly like a DEC node—no different from any other VAX on the network. It enables remote terminal access, file transfer, and remote file-access services over DECnet. In addition, a background listener allows you both to receive and to send VMS mail to DEC *All-In-One* users. Because the Mac is a DECnet node, it has equal client and server status with other DEC computers. As a result, you can edit a Mac file with a VAX-resident editor.

Dove Computer Corporation and Technology Concepts have jointly developed a DECnet solution for the Mac. The Mac accesses DECnet with Dove's FastNet Communication Control Unit. FastNet connects to the Mac via the SCSI port or RS-422 serial port; an Ethernet cable port connects the FastNet to the network. CommUnity, from Technology Concepts, is a portable implementation of DECnet. Like TSSnet, it also provides remote-terminal, task-to-task communications, and remote file-transfer and file-access services.

FastNet is an intelligent controller, with its own microprocessor and memory. This means that FastNet handles some of the lower-level DECnet communications overhead, resulting in a performance improvement under a heavy network load. However, because parts of the DECnet software reside in the FastNet, you need FastNet in order to run CommUnity. You can't use

Boosting Your Speed and Capacity

Ethernet's 10-megabit-per-second data rate means it transmits information more than 40 times faster than AppleTalk's twisted-pair wire. Coaxial cable allows more nodes per network and enables greater distances between nodes.

Because Ethernet coaxial cable is physically larger than twisted-pair copper wire, networks using Ethernet have greater bandwidth, or capacity. And because Ethernet is a wider highway, more people can use the media before cable capacity is reached. That means that network speed appears to be faster.

Although the advantage of Ethernet lies primarily in its larger capacity rather than in its faster speed, it's important to know that your file server will not run 40 times faster on Ethernet than it does on AppleTalk wire. Nor will your laser printer necessarily print any faster if it is on an Ethernet network. For one thing, Ethernet's 10MB-per-second data rate is a burst, or peak, speed; the sustained Ethernet data rate is more like 2.5MB per second. So you'll see only an increase of 10 times the previous speed.

In most cases, the speed of the network does not cause the bottleneck. Instead, CPU speed or disk input/output (I/O) time slows network performance. This problem is exacerbated when several users all try to access the file server at one time.

When you are laser printing a PostScript document, the bottleneck is caused not only by the speed at which the Mac can generate a PostScript file, but also by the speed at which the laser printer can print. In fact, tests done at Apple showed that in the 2000 seconds it took to print one document, only 8 seconds were spent on the network. If you use a direct Ethernet connection for a LaserWriter, you will see no difference in print speed.

You should expect a moderate improvement running *AppleShare,* especially if your network is large. The real speed gain comes if you have a Mac II server/client combination for *AppleShare* (simply because of the faster Mac II processor). Apple reports that a Mac II on Ethernet can result in file server performance similar to SCSI access speed for a hard disk.

Software by Protocol

Protocol	Product	Company	Price	Comments
AppleTalk	AlisaTalk	Alisa Systems	$3750 to $11,500	Connects Mac to VAX; includes file-server, print-spooler, and remote-terminal modules; compatible with entire line of Kinetics products.
	AppleShare PC	Apple Computer	n/a	Implements AppleTalk protocols on PCs so PCs can be part of AppleShare; requires AppleShare PC card for PCs.
	EtherTalk	Apple Computer	$699	AppleTalk Personal Network option for running AppleTalk applications; requires Ethernet hardware controllers with AppleTalk protocol support.
	K-Talk	Kinetics	$875 to $3500	Implements AppleTalk protocols for UNIX systems; K-Term terminal emulator and K-Spool UNIX-based LaserWriter spooler also available.
	pcLink	Pacer Software	$2000 to $37,500	Communicates directly to VAX systems, with AppleTalk protocols on VAX; includes terminal emulation, file transfer, virtual disk, and host printer access.
	TOPS	TOPS	$189 to $239	Uses AppleTalk protocols to connect Macs, PCs, and UNIX systems; PCs and UNIX systems require TOPS Network Interface Card; allows computers to share files, disks, and peripherals directly; no PC Ethernet access yet.
TCP/IP	pcLink	Pacer Software	$2000 to $37,500	Implements TCP/IP protocols on Mac for networking to UNIX systems; includes terminal emulation, file transfer, virtual disk, and host printer access.
	TOPS Terminal	TOPS	n/a	Provides AppleTalk link to TCP/IP networks; runs via AppleTalk/Ethernet bridge such as FastPath; offers multiple terminal-emulation windows and transparent file editing across environments.
DECnet	CommUnity	Technology Concepts	$400	Connects Mac to VAX, with Mac as DECnet node; provides virtual terminal and VT220 emulation, task-to-task communications, remote file access and transfer, network management; requires FastNet Ethernet controller from Dove Computer.
	Alisa TSSnet	Alisa Systems	$299 to $349	Connects Mac to VAX, with Mac as DECnet node; provides file transfer, VMS mail with background listener, remote-terminal service; uses Kinetics EtherSC or EtherPort SE (supplied by Alisa).
XNS	3+	3Com	$495	Supports IBM PC and Macs over 3+ network; AppleTalk and Token-Ring protocols sent via XNS over Ethernet; 3Server translates and filters information; supports EtherLink, EtherTalk, and EtherPort SE interface boards.

CommUnity with the Ethernet controller from Kinetics, which doesn't have the lower-level DECnet protocols installed.

UNIX Systems

Kinetics' *K-Talk* and TOPS's *TOPS* both provide AppleTalk protocols for UNIX machines. You install Kinetics FastPath/M or FastPath/Q boards to bring AppleTalk protocols to the UNIX host. The *K-Talk* software runs on the Mac and lets Macs communicate with the UNIX host via AppleTalk protocols over Ethernet.

TOPS for UNIX has the capability to connect Macs, PCs, and UNIX systems using its own TOPS command language. *TOPS* software translates network requests from the TOPS command language into UNIX commands, and vice versa. The UNIX computer is

ISO Reference Model

	AppleTalk	UNIX	XNS	Digital Network Architecture (DECnet)
Application	Application-specific protocols, file and record locking	NFS (network file system)	Clearinghouse (network directory)	file transfer, virtual terminals, remote resource access, down-line system load, remote command file submission
Presentation	AFP (AppleTalk filing protocol), PostScript	XDR (external data representation)	Courier (remote procedure call, remote file services)	
Session	ASP (AppleTalk session protocol), PAP, ADSP (data stream protocol)	RPC (remote procedure call)	none	task-to-task
Transport	ATP (AppleTalk transaction protocol), ECHO, NBP, ZIP	TCP (transmission control protocol)	Internet Diagram Protocol (sequence packets, packet exchange, routing, flow control)	
Network	DDP (datagram delivery protocol)	UDP (user datagram protocol), IP (internal protocol)		adaptive routing
Data Link	Ethernet / AppleTalk Personal Network	Ethernet	Ethernet	DDCMP point-to-point multipoint / X.25 / Ethernet
Physical				

physically linked to the AppleTalk-based *TOPS* network by either an Ethernet/AppleTalk gateway for the Mac, or an AppleTalk add-in board for the UNIX system. You can also use Pacer's TCP/IP implementation, *pcLink,* to connect the Mac to UNIX-based TCP/IP machines.

TOPS has also introduced a software AppleTalk link to TCP/IP-based networks. Called *TOPS Terminal,* it enables Macs to communicate with all TCP/IP computers via an Ethernet card or an AppleTalk/Ethernet gateway. The program allows Mac users to connect to any number of hosts simultaneously through multiple terminal-emulation windows. The number of host connections is limited only by the Mac's available RAM; TOPS claims to have run more than a dozen connections at the same time on a 512K Mac. You can also edit files from UNIX machines or PCs on *TOPS*- or TCP/IP-based networks.

TOPS for UNIX also allows you to use a UNIX system, such as a Sun workstation, as a gateway. In connecting with the Sun, the Mac can communicate with any node to which the Sun is attached. Because the Sun runs a high-level networking protocol called NFS (Network File System) with TCP/IP, the Sun's connection universe is in some respects greater than the Mac's.

NFS, developed by Sun Microsystems, TOPS's parent company, allows transparent remote file access on multivendor networks. NFS is now supported by more than 132 computer companies, including DEC, Apollo Computer, Data General, and Apple.

TOPS Terminal is TOPS's first step in converging *TOPS* and NFS. With NFS running directly on the Mac, the Mac will more easily access files on other NFS systems. TOPS expects to merge the current *TOPS* systems to NFS during the course of this year–without having to change the way users work with *TOPS*. In the meantime, another effort to bring NFS to the Mac under the Macintosh operating system is underway at the University of Michigan. That project is being done under contract for Apple.

A/UX

While the Macintosh operating system offers Ethernet connections to a variety of computers, A/UX–Apple's version of UNIX–promises to tie the Mac into even more Ethernet environments. In fact, the EtherTalk board was considered a major factor in the development of the Mac's UNIX operating system.

Included in the A/UX operating system are AppleTalk and TCP/IP protocols. So, under A/UX you'll be able to connect to both types of networks with Ethernet.

To connect to other UNIX systems via TCP/IP, you'll need the EtherTalk board, which allows you to perform file transfers and use the UNIX E-mail system. In addition A/UX also supports NFS from Sun.

NFS, however, is not the only multivendor networking environment the Mac will be involved with. The Network Computing Forum is a group of leading corporations and research centers that are focusing on

Hardware Paths

Mac Model	Product	Company	Price	Comments
Mac 512KE	FastNet	Dove Computer	$899	Mac 512KE must have SCSI adapter; can also be connected to serial port (RS-422); equipped with 512K of RAM and 68000 processor; supports DECnet protocols with CommUnity.
	FastPath	Kinetics	$2500	Supports Ethernet connection to any AppleTalk device; also connects entire AppleTalk LAN to Ethernet backbone; acts as AppleTalk/Ethernet bridge or gateway.
Mac Plus	EtherSC	Kinetics	$1250	Uses SCSI port to connect Mac directly to Ethernet; supports AppleTalk and TCP/IP protocols.
	FastNet	Dove Computer	$899	Can be connected via either SCSI or serial port; supports DECnet protocols with CommUnity.
	FastPath	Kinetics	$2500	Supports Ethernet connection to any AppleTalk device; also connects entire AppleTalk LAN to Ethernet backbone; acts as AppleTalk/Ethernet bridge or gateway.
Mac SE	EtherPort SE	Kinetics	$850	Add-in board for Mac SE; fully compatible with other Kinetics Ethernet controllers; supports both AppleTalk and TCP/IP protocols.
	EtherSC	Kinetics	$1250	Uses SCSI port to directly connect Mac to Ethernet; supports AppleTalk and TCP/IP protocols.
	FastNet	Dove Computer	$899	Can be connected via either SCSI or serial port.
	FastPath	Kinetics	$2500	Supports Ethernet connection to any AppleTalk device; also connects entire AppleTalk LAN to Ethernet backbone; acts as AppleTalk/Ethernet bridge or gateway.
Mac II	AST-ICP	AST Research	$999	Add-in communications board for Mac II under A/UX operating system; can act as Ethernet (TCP/IP) and AppleTalk bridge for multitasking A/UX.
	EtherLink	3Com	TBA	Add-in board for direct Ethernet access; includes AppleTalk protocol support; will include XNS support; can be used under A/UX.
	EtherTalk Interface Board	Apple Computer	$699	Add-in board for direct Ethernet access; includes AppleTalk protocol support.
	FastNet	Dove Computer	$899	Can be connected via either SCSI or serial port.

a new approach to computing. Apple is a member of that forum.

The approach, called *network computing,* was pioneered by Apollo Computer. Network computing allows different parts of a single application program to be distributed to computers best suited for each task. For example, the artificial intelligence portion of an application might best be run on a specific artificial intelligence workstation. That portion of the application could be automatically, and transparently, passed over the network to the AI workstation.

The goal of network computing is to take advantage of the strengths of very diverse computers—not just personal computers, but supercomputers, parallel processors, and minicomputers, all networked via Ethernet. □

See *Where to Buy* for product details.

The PostScript Difference

by Erfert Nielson

Drawing the lines between PostScript graphics applications: Cricket Draw, Illustrator, and LaserPaint compared

For Mac artists accustomed to the rough brushstrokes of bit-mapped painting programs, the transition to PostScript graphics is a quantum leap from the cave paintings of Lascaux to the fluid lines of Botticelli. PostScript graphics programs provide a direct link to a powerful programming language. At this time, three such programs are available: *Cricket Draw, Adobe Illustrator,* and *LaserPaint.* Others are just around the corner (see "P.S. There's More"). Each program has its own unique character, and each is appropriate for certain tasks. If you're considering buying a PostScript graphics package, the following comparison should help you decide which one meets your requirements.

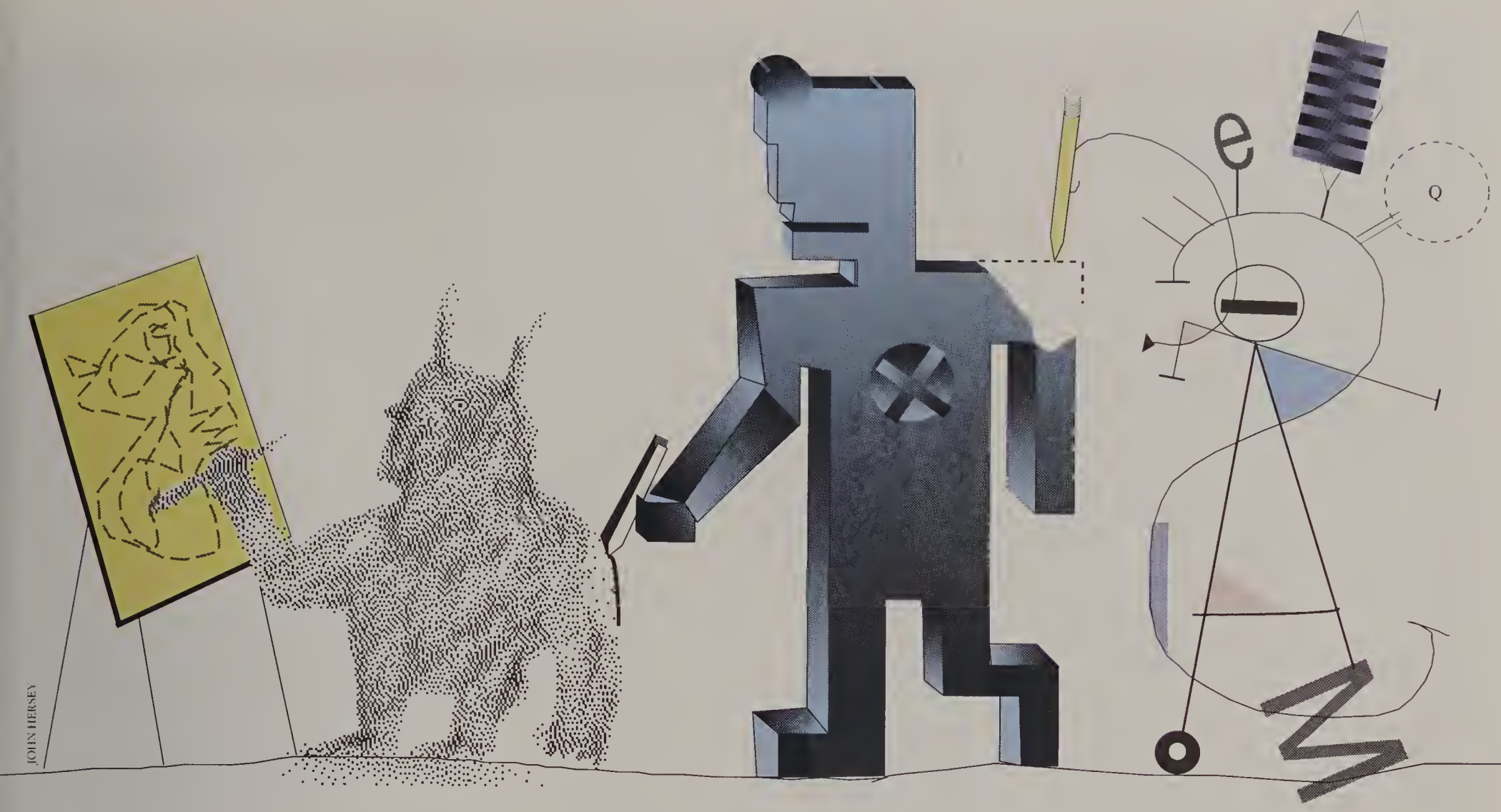
These three programs have been reviewed in previous issues of *Macworld;* for a detailed description of each, see "Rounding the Bezier Curve" (*Cricket Draw*), May 1987, "Illustrator: The Tracer's Edge," June 1987, and *Reviews,* September 1987 (*LaserPaint*). For a look at each program's color-separation capabilities, see "Beyond Black and White," *Macworld,* November 1987.

Why PostScript?

PostScript is the page-description language that resides in the LaserWriter and a handful of other *raster output devices*–devices that map an image as an array of individual pixels. A page can contain a combination of text, computer-generated graphics, and scanned images, all of which can be printed on a medium-resolution device like the LaserWriter or a high-resolution device like a Linotronic phototypesetter. One of the beauties of PostScript is the fact that it's *resolution-independent*–the same image can be output at the LaserWriter's 300 dots per inch (dpi), at 1270 dpi on a Linotronic 100, or at 2540 dpi on a Linotronic 300.

In the case of the LaserWriter, the LaserPrep utility translates commands from QuickDraw, the Mac's graphics language, into PostScript. But even with a good interpreter, subtleties are often lost in translation. It's more efficient to speak to the LaserWriter in its native language, which is just what PostScript graphics programs do. These programs also provide a *front end* to versatile PostScript commands that produce effects impossible in QuickDraw, such as hairlines, compound objects made up of lines and curves, gradient fills from one gray to another, and precise rotation of text and graphics. These programs also perform a valuable service to nonprogrammers; although PostScript contains some English-like syntax, it more closely resembles FORTH. (PostScript trivia buffs might be interested to know that PostScript is so named because, like FORTH, it uses *Postfix notation,* in which operators follow operands.)

For further information on PostScript, see "Getting Started with Postscript" in the December 1987 issue of *Macworld.* Now let's look at the three programs.



JOHN HERSEY

Cricket Draw

Those accustomed to *MacDraw* or *MacDraft* should have little trouble making the transition to Cricket Software's *Cricket Draw.* The program offers familiar tools such as line, rectangle, and oval, and the methods for drawing, moving, and resizing objects are comparable to those of *MacDraw* (see Figure 1). But unlike *MacDraw, Cricket Draw* takes advantage of many of PostScript's capabilities. For example, you can rotate text or objects in 1-degree increments, viewing a readout of the angle of rotation as you do so. You can fill shapes with linear, logarithmic, or radial *fountains,* smooth transitions from one gray to another. While a fountain effect can be attained in *Illustrator* by layering shapes of different shades, *Cricket Draw* produces gradient fills automatically.

Cricket Draw's text-handling capabilities are impressive: the program lets you mix fonts and styles in a single block of text. In addition, a special command lets you *bind* text to a curving shape or line. In the text-effects department, *Cricket Draw* has *Illustrator* beat in many respects.

Finally, *Cricket Draw*'s *transfer modes* let you create dot or line screens for printing halftones or creating color separations. Unfortunately, this capability isn't mentioned in the manual. You have to refer to the semiannual technical notes that are sent to registered *Cricket Draw* owners, or find out for yourself by word of mouth or by accident (to access *Cricket Draw*'s transfer modes, hold down the Option key and click the object fill control box in the lower-left corner of the screen).

Why choose *Cricket Draw?* Graphic designer John Odam uses both *Cricket Draw* and *Illustrator,* and finds *Cricket Draw* more appropriate for sketches and illustrations that he wants to produce quickly. "With *Illustrator,*" he says, "you must have a firm idea of what you want before drawing; *Cricket Draw* is better for freehand drawing." In Odam's opinion, "*Illustrator* is designed with the professional in mind, while *Cricket Draw* is for both professionals and amateurs." His main complaint about *Cricket Draw* is its inability to combine lines and curves into a compound object.

Designer Michael Singleton also uses both *Illustrator* and *Cricket Draw.* He considers *Cricket Draw* an extension of *MacDraw,* with added features for graphic artists. Singleton cites *Cricket Draw*'s text capabilities and ability to display angles and coordinates as pluses over *Illustrator,* but found the program's curve-handling limited. In addition, he found little use for some of *Cricket Draw*'s tools, such as the starburst and the diamond. He finds *Cricket Draw* appropriate for projects such as organization charts and schedules, pointing out that the grate tool is excellent for creating tables and other forms with parallel lines.

I talked to several more users, and the consensus was that *Cricket Draw* is easy to learn because of its *MacDraw*-like interface, is a good choice for producing freehand drawings that include PostScript special effects, and is accessible to amateurs as well as professional artists. It is also, incidentally, cheaper than either of the other PostScript graphics programs.

P.S. There's More

If you're shopping for a PostScript graphics program, you'll soon have two more contenders to contend with. Both should be available early this year. Aldus Corporation, well known for its *PageMaker* page-layout program, plans to release a PostScript graphics program developed by Altsys. In addition, PS Publishing has announced a graphics program called *Collage.*

A preview of *Collage* at the Seybold Desktop Publishing Conference revealed a program along the lines of *Illustrator,* but with some additional features. Like *Illustrator, Collage* lets you create paths made up of lines and curves. A spline curve tool allows you to add or move points, offering flexible curve editing. Unlike *Illustrator, Collage* will let you use PostScript commands such as scale, skew, and rotate to modify a bit-mapped template once it is pasted in (this feature was not yet implemented at the Seybold conference). Other features include a status bar that displays angles and coordinates; a snap-to grid; units of measurement including points, picas, inches, and centimeters; the ability to hide layers; and color display and printing.

Aldus's program, code-named MasterPiece at the time of this writing, will offer many of the same features as *Collage,* including a freehand drawing tool to draw or trace images; PostScript effects such as scale, skew, and rotate; rulers; a snap-to grid; layers; an information bar; color capabilities; and the ability to break a shape into its component curve segments. Special features include gradient fills; eight levels of Undo and Redo; the ability to edit a drawing in Preview mode; and clipping paths, or *friskets.* An invaluable feature allows you to make graphic style sheets and templates, maintaining consistency from one publication to the next. MasterPiece looks strong in the area of text manipulation as well. Text attributes include binding text to a path, multiple fonts and styles in a block of text, gradient fills, and automatic or manual kerning.

Both of these programs look promising, but no matter how good a PostScript graphics program is, converting a bit-mapped image to a PostScript outline is still a time- and labor-intensive task. Wouldn't it be nice if a program could automatically trace a template for you? This wishful thinking isn't as far-fetched as it sounds. Soon we'll see *scan conversion* programs, miraculous applications that do much of the dirty work of tracing a bit-mapped image. Now, if someone would just come up with a utility that cleaned up those images and added fill patterns, all you graphic artists could simply write a few macros and then take that long-overdue vacation.

Adobe Illustrator

Illustrator is usually viewed as a program for professional artists and designers. Although some artists use *Illustrator* as a freehand drawing tool, most use it to convert images from other media into crisp, clean PostScript artwork (see Figure 2).

Generally speaking, you use *Illustrator* as follows. First, an image *template* is created and pasted into *Illustrator.* The original image can be a pen or pencil drawing converted to a bit-mapped image by a scanner, a scanned version of a photo, or artwork created with a Mac graphics program such as *SuperPaint* or *MacDraw.* The template is displayed in gray so as not to obscure the next part of the process, in which you trace the image with *Illustrator*'s pen tool, which produces straight lines and *bezier curves.* A series of curve segments make up a *path* in *Illustrator* terminology.

Precise curve-manipulation is one of *Illustrator*'s strong points. Once you draw a path, you can reshape it by dragging *anchor points* (the points at the beginning and end of a curve) and *direction points* (points that determine the curve's shape). A path can be edited at any time; you can move or add anchor points, drag direction points, or delete segments to position the path over the template precisely. A closed path, or shape, can be filled with black, white, or a gray scale. Shapes are stacked one on top of another to build complex, multishaded illustrations.

Michael Singleton uses *Illustrator* to create maps—scanning an image, tracing it, and adding text and other details. "It's the first program that's given me the capability to produce really good-looking graphics on the LaserWriter and the Linotronic 300," he comments. Singleton praises *Illustrator*'s ability to produce two curved paths precisely parallel to one another. To accomplish this, he draws the first object with, say, a 2-point line width, copies it and pastes the copy over the original, and sets the second path to a 1-point white line. The result is two parallel ½-point-wide curves. Singleton's wish list for *Illustrator* includes a display of angles and coordinates, rulers

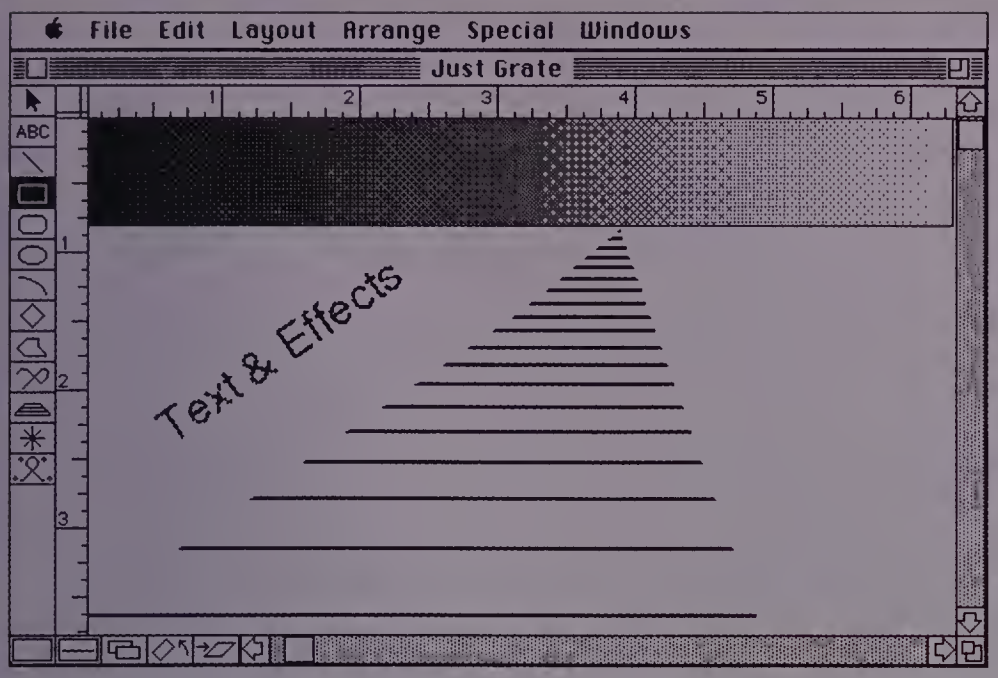
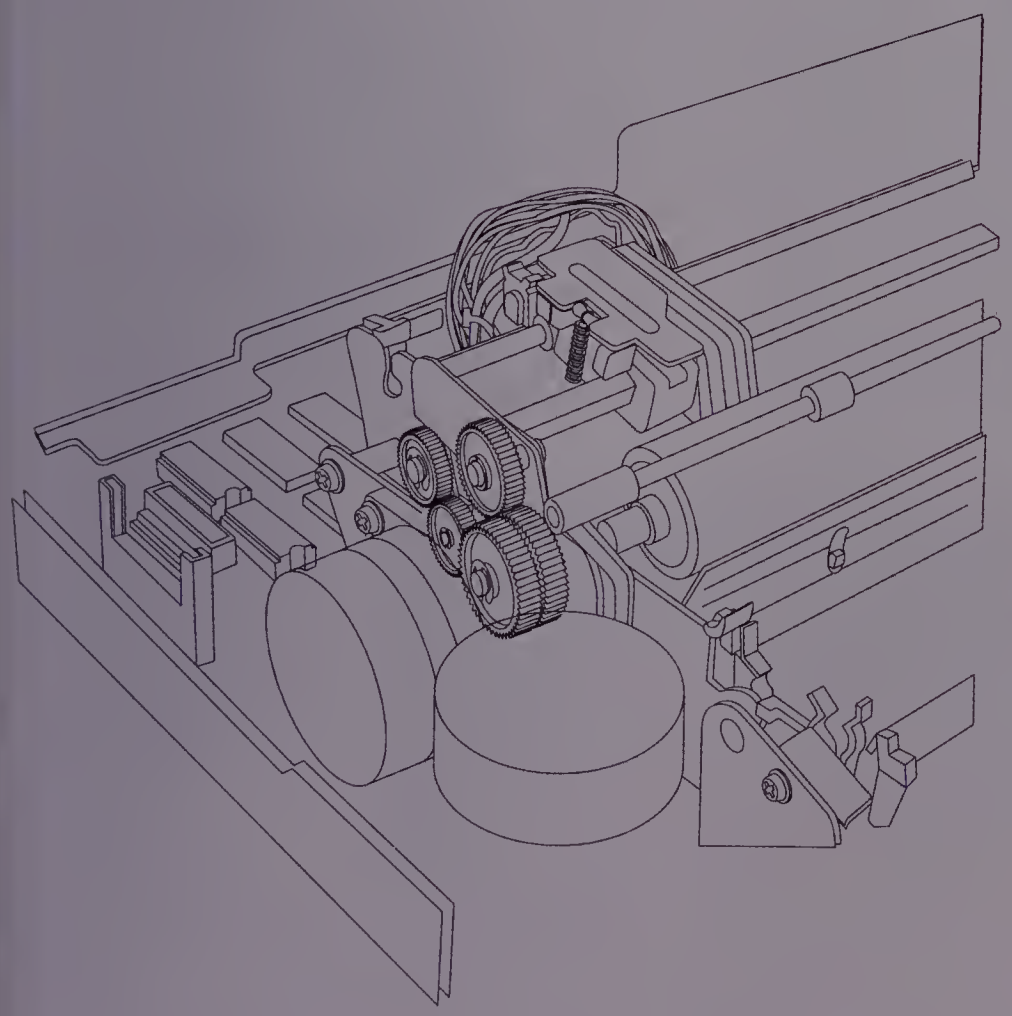




Figure 1
Cricket Draw's *forte is PostScript special effects. Combine the program's drawing tools with effects such as gradient fills and rotation in 1-degree increments to create anything from a simple organization chart to an intricate illustration. The highly shaded image of a camera (right) was created by Novus Graphics, a graphic arts firm based in Monroeville, Pennsylvania.*



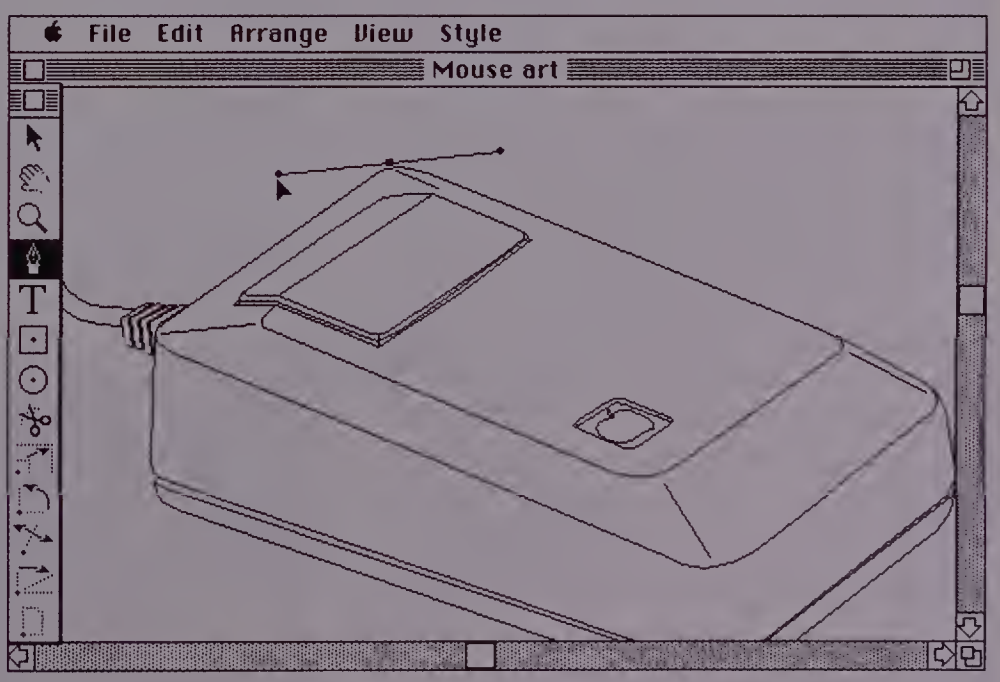


Figure 2
Illustrator *offers precise control of bezier curves. The program's ability to combine lines and curves into complex shapes, coupled with control of line weight and fill patterns, lets professional artists and illustrators take full advantage of PostScript. Jeffery West used* Adobe Illustrator *to create the detailed technical drawing on the left for Apple Computer.*

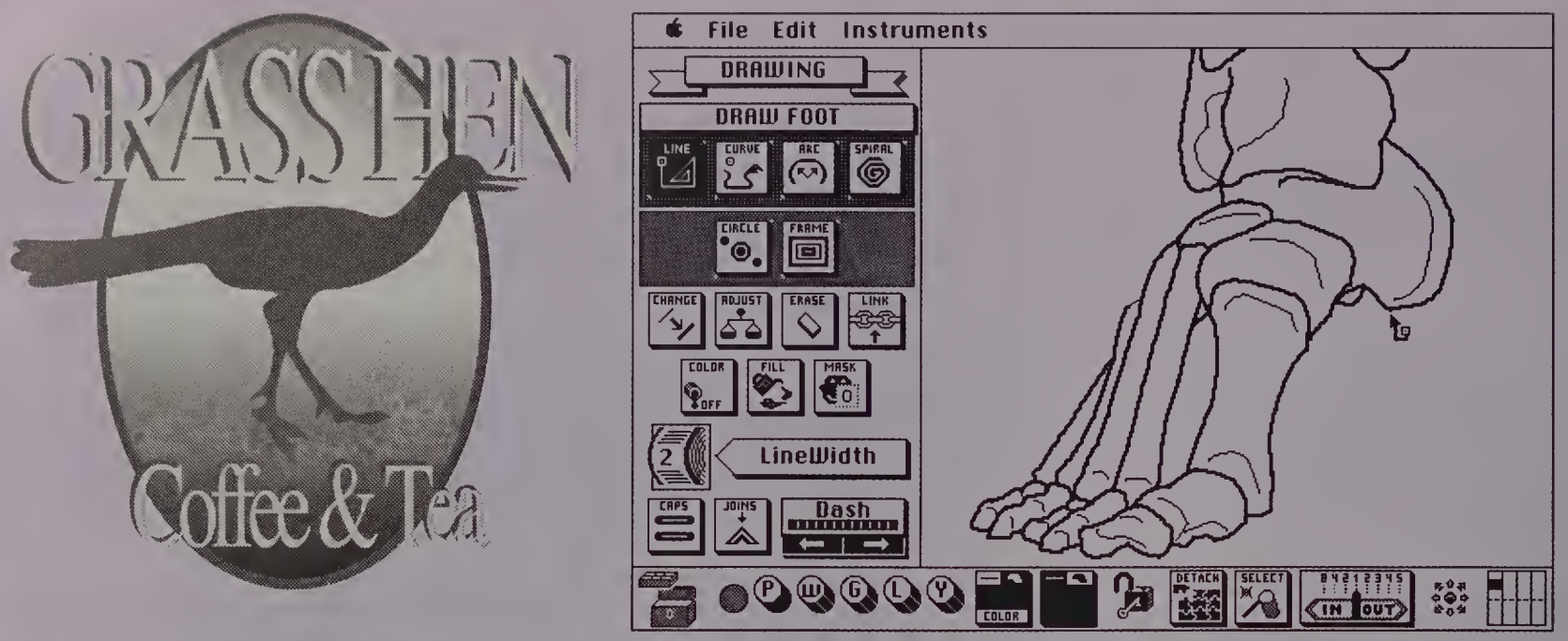


Figure 3
LaserPaint*'s Drawing panel provides an array of tools, including lines, curves, and shapes. Unlike other PostScript graphics programs,* LaserPaint *includes word processing and bitmapped painting modules. Hartley Healey designed the Grass Hen logo using LaserWriter percentage screens to get the screened-text effect.*

not limited to picas and points, better control of layers, and the ability to edit the template.

Jeffery West finds *Illustrator* the ideal tool for technical illustrations. He converted from the traditional method of drawing on vellum with pen and ink to the clean lines of *Illustrator.* West finds that *Illustrator* doesn't drastically speed the drawing process–he still has to draw a sketch, scan it in, and trace it–but the program has other advantages that save time and avoid tedium. For example, if a drawing contains multiple versions of the same element, he can draw one element and copy it–scaling, rotating, or otherwise altering it if necessary. In addition, an *Illustrator* drawing can be easily edited. If he needs to change a line weight or a shade, he can quickly accomplish the change. If a client wishes to make changes, West can usually edit the original drawing rather than starting over. West also appreciates *Illustrator*'s ability to scale a drawing without altering line weights. His only complaint is that the Mac's screen resolution isn't accurate enough to gauge details, forcing him to print numerous proofs.

Newsletter publisher Robert Eckhardt used *Illustrator* to create the two-line title for his newsletter masthead. He had difficulty making the two lines of type the same length; text that lines up on the screen does not necessarily line up on the LaserWriter. He finally made a series of minute adjustments and printed successive proofs on the LaserWriter. He found it more efficient to do five or six experiments on a single page and then print an entire page of adjustments, rather than print one experiment at a time. Although he initially had some difficulty learning to edit *Illustrator*'s bezier curves, once he became proficient with the program Eckhardt was pleased with the way he could use one hand for keyboard commands and the other for the mouse, without interrupting his work to select tools.

The consensus? *Illustrator* is an appropriate tool for professional artists, graphic designers, and technical illustrators. It is not as easy to learn and use as *Cricket Draw;* beginners may have trouble wrestling with bezier curves at first. But most users seem to agree that once *Illustrator* is mastered, it enables them to take advantage of most of PostScript's talents to create high-quality artwork.


ROBERT HOLMGREN

Technical illustrator Jeffery West uses Illustrator *to modify drawings once he has created the original images using traditional techniques.*

LaserPaint

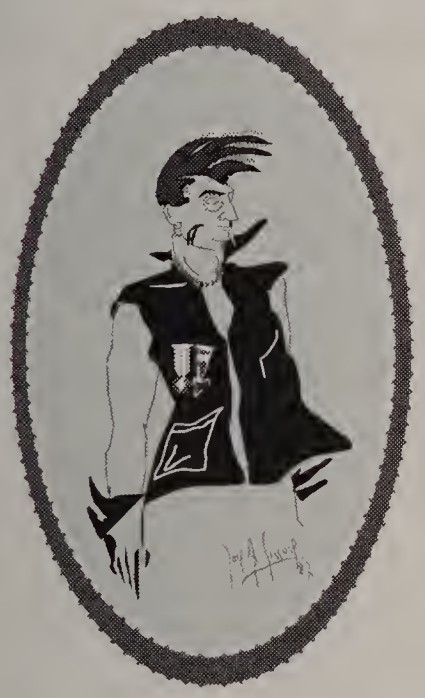
The newest arrival in the PostScript graphics arena is LaserWare's *LaserPaint.* This unusual program is really five mini-programs rolled into one: drawing, bitmapped painting, text, PostScript effects, and printing specifications. Each of the program segments is housed in its own panel; click a button to move from one panel to another. We'll focus on *LaserPaint*'s PostScript capabilities, which straddle several of its panels.

LaserPaint offers many of the tools and effects found in *Cricket Draw* and *Illustrator.* The program's Drawing panel provides tools such as a curve, line, arc, circle, and rectangle, as well as fill patterns and masks. Line width is determined by a

PostScript Clip Art

It's not surprising that purveyors of computerized clip art now provide illustrations in PostScript format. In the past few months four companies have announced clip-art collections that include images created with *Cricket Draw* and *Illustrator.*

Olduvai Software, a newcomer to the Mac marketplace, offers the *Post-Art* collection, a three-disk set of images in *MacDraw, Cricket Draw,* and *Illustrator* format. Subject matter includes human figures, animals, and abstract designs. *Post-Art* seems to be intended more as Art than as clip art, however (each drawing is signed by the artist, which is uncommon in the generic world of mass-produced art). Most of the drawings would not be suitable for embellishing invitations, newsletters, and the like.



Olduvai Software

Studio Advertising Art offers *Click & Clip,* a collection of illustrations in *Illustrator* or EPS format. Subject areas include seasons, borders, business, and sports. *Click & Clip* includes two disks of artwork and an image catalog for $39.95, four disks for $67.00, or eight disks for $124.50.

Image Club Graphics, a Canadian company that already offers Mac clip art in *MacDraw* format, has announced *Digit-Art Laser Graphics Volume 3,* a five-disk set of graphics in EPS format. The set includes approximately 150 images in categories such as business, sports, entertainment, and travel, and sells for $149.



Image Club Graphics

Mac old-timers may remember that T/Maker came out with some of the first Macintosh software in 1984: a disk of *MacPaint* clip-art images. Their latest clip-art offering is *ClickArt EPS Images Volume I,* which includes more than 125 images in EPS (Encapsulated PostScript) format. Files saved in this format can be opened by *Illustrator* or *Cricket Draw,* as well as a number of page-layout programs. The illustrations span numerous subject areas–including entertainment, publishing, animals, and transportation–and sell for $129.95.



T/Maker

Last, but by no means least, is a collection from Multi-Ad Services, a leading distributor of advertising art. Multi-Ad's Kwikee Inhouse Graphics Services offers subscribers more than 75 images a month on CD ROM disks. Many of the graphics are produced with *Illustrator.* A subscription to the service costs $200 a month, plus $25 for each Mac workstation. In addition to providing generic graphics, Inhouse Graphic Services also creates custom logos and artwork with *Illustrator* for customers with specialized needs. (For more information on Multi-Ad's graphics services, see *Macworld News,* July 1987.)

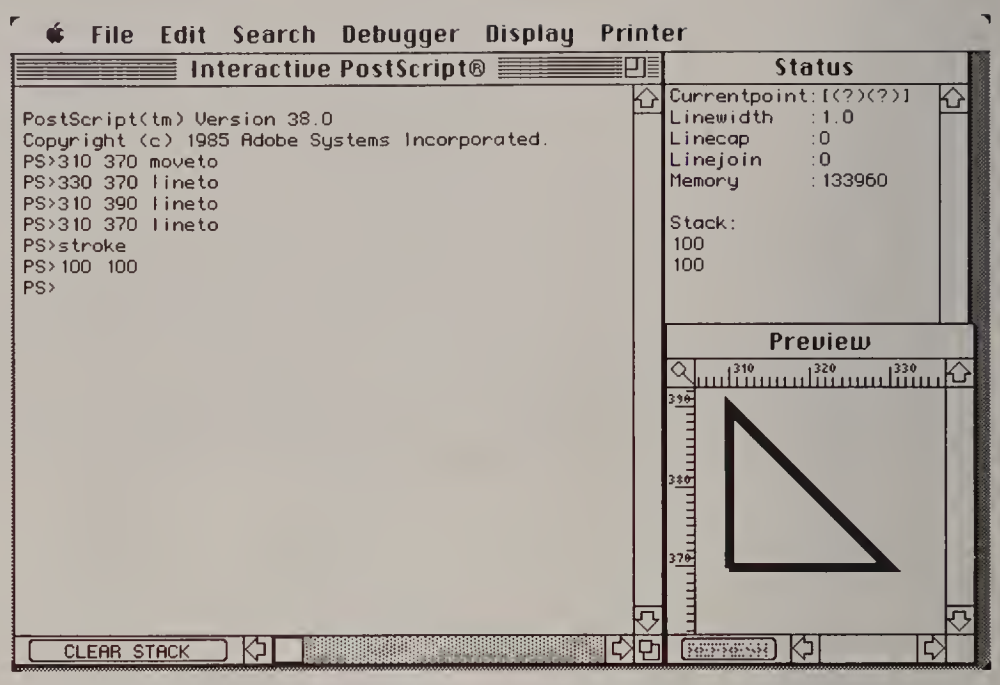


Multi-Ad Services

Follow the Yellow Brick Code

PostScript programmers take heart! *LaserTalk,* a new PostScript development system from Emerald City Software, gives you access to the interpreter in the LaserWriter or other PostScript printers. *LaserTalk* links a Mac Plus, SE, or II to the printer's PostScript interpreter via AppleTalk; as you type commands, you see them executed in an interactive PostScript window. *LaserTalk*'s status window displays the state of PostScript variables and stacks after each line is sent to the printer. In addition, a preview window shows what will be printed, freeing you from printing proofs each time you alter your program.

LaserTalk's editor includes Undo, Search and Replace, and Clipboard support. An interactive debugger provides tracing, stepping, and breakpointing, with line-by-line error detection and status updates. The system includes help features as well. A dictionary browser shows you all loaded dictionaries and procedures, and PostScript operators are defined with excerpts from Addison-Wesley's *PostScript Language Reference Manual.* PostScript is a bona fide programming language. It's high time it had a development system.



unique thumbwheel control, and different styles of caps and joins can be selected by clicking an icon (see Figure 3).

Enter the Goodies panel to access PostScript effects such as rotate, skew, mirror, scale, and gradient fill. So far, *LaserPaint* sounds quite similar to the other PostScript programs. Unlike the others, however, *LaserPaint*'s drawing area spans eight pages. Another of the program's strong points is its text handling. Like *Cricket Draw, LaserPaint* lets you bind text to a path, assign a pattern to text, and mix fonts and styles in a block of text. But *LaserPaint*'s text module is more akin to a word processor or page-layout program than to the text functions you'd expect in a graphics program. The Writing panel offers features such as multiple columns, justification, and leading and kerning adjustment. The Writing panel also operates in conjunction with the Drawing panel's masks to fill a shape with text or wrap text around a shape.

Finally, the Laser panel includes printing features such as registration marks, trim and fold marks, and color separations. A clip option lets you print outside the normal print area.

Graphic designer Joseph Maas chose *LaserPaint* over *Illustrator* in part because of *LaserPaint*'s text-wrap and gradient-fill features. He finds the program adequate for most of his work, but claims it's awkward for precision work. He also finds it difficult to align a drawing precisely in the center of a page, with an even border all the way around.

Charles Scholdt, director of Weather Central, a weather forecasting service that provides weather maps to a number of newspapers, is another *LaserPaint* user. He chose the program because of its text-wrap and color-separation features, both of which facilitate the production of Weather Central's maps, which were formerly produced with *MacDraw.*

Although *LaserPaint* is long on features, it's not perfect. Almost every user I talked with complained about the program's unorthodox user interface and its poor documentation. *LaserPaint* deviates from Mac interface conventions in several respects, from iconography to the way tools operate. (One unkind critic referred to "the interface from Mars.") On the other hand, most *LaserPaint* users spoke highly of LaserWare's prompt replies to questions and willingness to implement users' suggestions.

Buying Decisions

So what's the bottom line? Generally speaking, *Cricket Draw* is a good choice for those who want easy access to Post-

Script effects for freehand drawing, creating charts and forms, or adding graphic touches to ads, newsletters, and other desktop publications. *Cricket Draw*'s abilities to combine fonts and styles in a single block of text and automatically create gradient fills are not found in *Illustrator*. *Cricket Draw* has the lowest price tag and the most accessible interface of the three programs, but it lacks the ability to combine curves and straight lines into compound shapes.

Illustrator is not for the casual user. Compared to *Cricket Draw,* the program has a steep learning curve, as it were, but it offers professional artists precise control over curved shapes. *Illustrator* excels at converting scanned images into PostScript. Some artists use *Illustrator* for freehand drawing, but most find that too much planning is necessary to make the program effective for drawing from scratch. If you intend to purchase *Illustrator,* keep in mind that you'll need a scanner and possibly a paint program as well.

LaserPaint is for artists or publishers who prefer the integrated approach. Drawing, painting, text, and printing options abound, but bear in mind that you'll encounter a nonstandard interface. This program might be appropriate for those who want to work with text and graphics in the same document and don't mind learning many modules.

If you're still undecided, Table 1 will help you compare the features of the three programs. Before deciding what to buy, carefully assess which PostScript effects are essential for the graphics you want to produce. Do you want to draw freehand illustrations or convert scanned images into PostScript? Will you concentrate on illustrations, or frequently combine text and graphics? You should also consider how much time and money you're willing to invest, and whether you'll need auxiliary equipment such as a LaserWriter or a scanner. Although *Cricket Draw, Illustrator,* and *LaserPaint* differ in their approaches to PostScript graphics, the three programs have one thing in common: they give artists access to a programming language designed to produce art. □

See *Where to Buy* for product details.

The PostScript Lineup

Tools	Cricket Draw	Illustrator	LaserPaint
Curve, straight line	●	●	●
Freehand drawing	●		
Polygon	●	●	●
Starburst	●		
Arc	●		●
Parallel lines (grate)	●		
Dotted/dashed lines	9 styles	adjustable	adjustable
Compound shapes (lines + curves)		●	●
Tools auto-scroll	●	●	●
Shapes			
Rectangle, oval	●	●	●
Rounded-corner rectangle	●		●
Diamond	●		
Adjustments			
Align objects	●		
Grid snap	●		●
Rulers	in., cm, picas, pixels	points, picas	in., cm, picas, pixels
Grouping	●	●	●
Locking	●	●	●
Zoom	7 levels	9 levels	7 levels
Display dimensions, angles	●		●
Line caps, joins		●	●
Customize tool palette			●
Effects			
Gradient fill (fountain)	●		●
Shadow	●		
Rotate by degree	●	●	●
Halftone screens	●		●
Text			
Bind to path	●		●
Mix fonts, styles, sizes in block	●		●
Adjust leading		●	●
Adjust kerning		●	●
Wrap around object			●
Data Transfer			
Export	EPS, PICT, PS code	EPS, PS code	EPS, PS code, TIFF
Import	MacDraw[1], PICT	MacPaint, PICT	MacPaint, PICT, TIFF
Edit PostScript code	●		
General			
Version	1.0	1.1	1.1
Requires	512K	Mac Plus	Mac Plus
Copy protection	none	key disk[2]	key disk[3]
Price	$295	$495	$495

[1]According to a Cricket Software representative, version 1.1 will also import *Illustrator* files in EPS format.

[2]A non-copy-protected program disk is sent to owners who send in their registration cards.

[3]According to a LaserWare representative, copy protection will be removed in the next version.

Prime Numbers.

Sum service! Sum support!

It wasn't easy fitting the runway between the apple trees, but your orders now ship Airborne Express for overnight delivery. (Orders within UPS Ground Zone 1 ship UPS for next day delivery.)



DC 9



8:00 PM

Practically all orders phoned in by 8:00 PM EST will ship the same night for next day delivery (in most cases by noon). You could almost set your clocks on it.

Three slick little greenbacks. Enough for a cup of gourmet java, or to fly your order anywhere in the continental U.S. overnight.

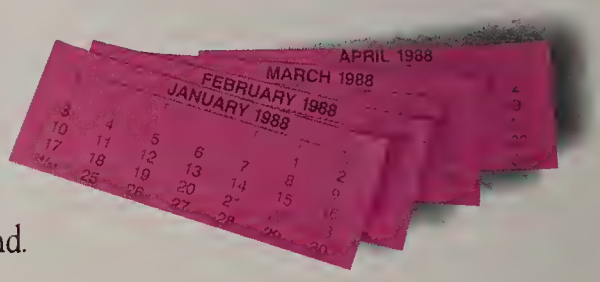
That's it, the total shipping charge for our exclusive Fly-by-Night℠ service. $3.00, inclusive.



$3.00

120 days

172,800 minutes free of fear of failure. Every single product we sell is warranted by us for at least four months. In addition, many manufacturers warranties extend up to five years and beyond.



Because our inventory turns over so quickly you'll only receive the latest versions. Period.



V.3.12

The extras are standard.

- No sales tax.
- No charge for insurance on U.S. orders.
- No surcharge for credit card orders.

$0.00

- No freight charge on backorders.
- No charges to your credit card until we ship.
- No charge for sales or technical support calls.

MacConnection™

14 MILL STREET, MARLOW, NH 03456 1-800/Mac&Lisa or 603/446-7711

©Copyright 1987 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc., Marlow, NH.

Latest versions.



Nashoba Systems ... NCP
FileMaker Plus—Outstanding forms and database management program. Performs calculations, mail mergings, etc..... $149.

HD Backup *(supports MFS, HFS)* . . . . . 28.
Personal Computer Peripherals ... NCP
HFS Backup . . . . . 29.
ProVUE Development ... NCP
OverVUE 2.1 *(power-packed database)*. . . 149.
Rubicon Publishing ... CP
Dinner At Eight-Silver Palate Bundle . . . . . 51.
Satori ... NCP
BulkMailer 3.0 *(mailing lists)* . . . . . 82.
BulkMailer Plus *(up to 90,000 names)* . . . . 199.
Legal Billing *(attorneys to accountants)* . . . 379.
Legal Billing II *(full trust accounting)*. . . . . 569.
Project Billing *(architects to engineers)*. . . . 442.
Silicon Beach Software ... NCP
Silicon Press *(printer utility, 512k)* . . . . . 41.
SuperPaint *(advanced graphics program)* . . 79.
Simon & Schuster ... NCP
Mac Art Department *(req. Paint program)* . . 24.
Typing Tutor IV *(new & improved)*. . . . . 35.
SoftStyle ... NCP
Epstart *(Epson printer driver)* . . . . . 27.
Printworks *(print faster & in color)*. . . . . 46.
Laserstart *(Hewlett-Packard Laserjet)*. . . . . 58.
Softview ... NCP
Macinuse *(time-use manager)*. . . . . 42.
Software Discoveries ... NCP
Record Holder Plus *(data manager)* . . . . . 45.
Software Supply ... NCP
Suitcase *(font and DA utility)* . . . . . 38.
PowerStation *(alternative to Finder)* . . . . . 38.
Software Ventures ... NCP
Microphone 1.1 *(includes Glue™)*. . . . . 119.
Solutions, Inc. ... NCP
SmartScrap & The Clipper . . . . . 40.
Glue *(creates "print to disk" capability)* . . . . 40.
SuperGlue *(total graphic integration)* . . . . . 57.
Springboard ... CP
Art a la Mac Volume 1 *(NCP)*. . . . . 23.
Art a la Mac Volume 2 *(NCP)*. . . . . 23.
Early Games or Easy as ABC . . . . . 28.
Certificate Maker *(requires 512k)* . . . . . 35.
Certificate Library Vol. 1 . . . . . 19.
SuperMac Software ... NCP
SuperSpool 3.4 . . . . . 45.
Diskfit *(backup & restore utility)* . . . . . 45.
Network Diskfit *(automatic back up)* . . . . . 205.
Sentinel *(encryption)*. . . . . 85.
SuperLaserSpool . . . . . 85.
Multi-User SuperLaserSpool . . . . . $205.
Survivor Software ... NCP
MacMoney *(financial planner)* . . . . . 41.
Symmetry ... NCP
Acta 2.0 *(outline/writing desk accessory)* . . . 37.
PictureBase 1.2 *(clip art manager, 512k)* . . . 59.
Think Educational ... CP
MacEdge II *(math & reading)*. . . . . 28.
Mind Over Mac . . . . . 28.
THINK Technologies ... NCP
HFS Navigator *(search for buried files)*. . . . 35.
Laserspeed *(LaserWriter utility)* . . . . . 55.
Lightspeed Pascal. . . . . 65.
Lightspeed C *(top-rated C Compiler)* . . . . . 95.
CAPP's for Lightspeed C. . . . . 49.
InBox Starter Kit *(CP)* . . . . . 215.
InBox Personal Connection *(Mac & PC)*. . . call
T/Maker ... NCP
ClickArt Personal Graphics . . . . . 28.
ClickArt Effects. . . . . 28.
ClickArt Publications. . . . . 28.
ClickArt Letters Vol. 1 or 2 . . . . . 28.
ClickArt Holidays . . . . . 28.
ClickArt Business Image. . . . . 28.

True BASIC ... NCP
True BASIC—Flexible structured programming version of BASIC. Optional programming and educational software libraries available . . . $59.

Christian Images . . . . . 35.
Bombay, Plymouth, or Seville Laser font . . . 45.
WriteNow *(word processor)* . . . . . 99.
TML Systems ... NCP
TML Source Code Library . . . . . 55.
TML Database Toolkit . . . . . 59.
TML Pascal *(compiler, req. 512k)*. . . . . 59.
TOPS ... CP *(formerly Centram Systems)*
TOPS *(file-server/LAN software)* . . . . . 119.
TOPS PRINT . . . . . 125.
TOPS for the PC . . . . . 299.
True BASIC ... NCP
PROGRAMMING LIBRARIES
True BASIC *(fast, flexible, & portable)*. . . . . 59.
Runtime *(create stand-alone applications)* . . 59.
3D Graphics . . . . . 35.
EDUCATIONAL SOFTWARE
Algebra I or II, Pre-calculus, Trigonometry, Discrete Math, Probability, Calculus, Arithmetic & MacFunction . . . . . *each* 35.
TrueSTAT *(statistics)*. . . . . 58.
Unicorn ... CP
Animal Kingdom *(ages 6-12)*. . . . . 27.
Decimal Dungeon *(math, ages 9 and up)* . . 27.
Fraction Action *(arcade style math game)* $27.
Mac Robots *(pre-school program)*. . . . . 27.
Math Wizard *(math games, ages 5-10)*. . . . . 27.
Read-A-Rama *(reading, ages 5-8)*. . . . . 32.
William & Macias ... NCP
myDiskLabeler *(design & print labels)* . . . . . 24.
myDiskLabeler w/Color *(req. Imagewriter II)* 32.
myDiskLabeler w/LaserWriter option . . . . . 35.
216 Smart Labels *(for Imagewriter)*. . . . . 15.
216 Laser Labels *(for LaserWriter)* . . . . . 19.
Working Software ... NCP
Lookup *(90,000 word dictionary)* . . . . . 29.
Findswell *(locate documents fast)* . . . . . 32.
Spellswell *(spelling checker)* . . . . . 42.
Spellswell Legal or Medical Dictionary . . . . 57.

GAMES

Accolade ... CP
Hardball *(baseball simulation)* . . . . . 23.
Activision ... CP
Championship Star League Baseball. . . . . 15.
Tass Times in Tonetown . . . . . 21.
Shanghai *(Mah Jongg strategy)*. . . . . 24.
Portal *(sci-fi novel)* . . . . . 30.
Addison-Wesley ... CP
Puppy Love *(your dog will love it!)*. . . . . 19.
Ann Arbor
Grid Wars *(3D arcade)*. . . . . 22.
Avalon Hill ... CP
MacPro Football *(req. 512k)*. . . . . 29.
MacPro Football 85 Team or Season . . . . . 16.
Baudville ... CP
Guitar Wizard . . . . . 22.
Ted Bear's Rainy Day Games. . . . . 22.
Blue Chip ... CP
Millionaire or Tycoon . . . . . 35.
Squire or Baron. . . . . 35.
Broderbund Software ... CP
Lode Runner *(over 150 levels)* . . . . . 24.
Ultima III *(fantasy adventure)* . . . . . 24.
Ancient Art of War *(military strategy)*. . . . . 27.
Toy Shop *(create working models)* . . . . . 31.
Bullseye ... CP
Ferrari Grand Prix *(Formula One racing)*. . . 33.
Fokker TriPlane Flight Simulator . . . . . 33.
Electronic Arts ... CP
Ogre *(tank simulation)* . . . . . 20.



Bogas Productions ... NCP
Studio Session—MacUser 1986 Music Product of the Year. Includes Editor and Player. Excellent manual . . . . . $57.

$3 does it all.

SOFTWARE

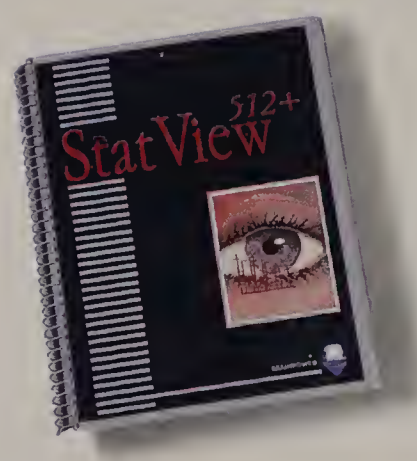
NCP denotes not copy-protected.
CP denotes copy-protected.

Aba Software ... NCP
"Draw it again Sam" . . . . . $99.
Activision ... NCP
Postcards *(clip-art, card stock)* . . . . . 20.
Aegis Development ... NCP
Doug Clapp's Word Tools . . . . . 42.
Affinity Microsystems ... NCP
Tempo *(power user's macro utility)* . . . . . 54.
Allan Bonadio Associates ... NCP
Expressionist *(equation processor)* . . . . . 52.
ALSoft ... NCP
DiskExpress *(maximize disk performance)* 26.
Font/DA Juggler . . . . . 26.
Altsys ... NCP
FONTastic Plus *(advanced font editor)* . . . . 48.
Fontographer *(LaserWriter font editor)* . . . 243.
Ann Arbor ... NCP
FullPaint *(advanced Paint program)* . . . . . 49.



Borland International ... NCP
Reflex Plus—High-powered relational database. Features built-in number crunching and extensive sorting . . . . . $165.

Ashton-Tate ... NCP
dBASE Mac 1.0 *(relational, req. MacPlus)* 299.
Batteries Included ... NCP
Thunder! 1.23 *(spelling checker)* . . . . . 31.
Battery Pak *(9 desk accessories)* . . . . . 31.
Isgur Portfolio *(portfolio management)* . . . 129.
Berkeley System Design ... NCP
Stepping Out *(requires 512k)* . . . . . 55.
Blyth ... NCP
Omnis 3 Plus *(database generator)* . . . . . call
Omnis 3 Plus *(2-5 users)* . . . . . call
Omnis 3 Plus *(6-10 users)* . . . . . call
Bogas Productions ... NCP
Studio Session *(music creation)* . . . . . 57.
Heavy Metal Rock Disk . . . . . 15.
Country Disk . . . . . 15.
Borland International ... NCP
Turbo Pascal Tutor . . . . . 49.
Numerical Methods Toolbox . . . . . 59.
Sidekick 2.0 *(includes MacPlan)* . . . . . 59.
Turbo Pascal *(HFS compatible)* . . . . . 59.
Reflex *(while supplies last)* . . . . . 59.
Reflex Plus *(info management tool)* . . . . . 165.
BrainPower ... NCP
Thinkfast *(memory improvement)* . . . . . 23.



BrainPower ... NCP
StatView 512+—Professional data analysis package. Includes multivariate and factor analyses, graphics, and more . . . . . $178.

StatView *(statistics package)* . . . . . 34.
Graphidex *(DA graphics organizer)* . . . . . 65.
DesignScope *(electronic circuit design)* . . 128.
MathView Professional *(num. analysis)* . . . 149.
StatView 512+ *(req. external drive, 512k)* . . . 178.
Bravo Technologies ... NCP
MacCalc *(easy to use spreadsheet)* . . . . . 79.
Broderbund ... CP
Print Shop *(create cards and memos)* . . . . . 38.
Geometry *(over 350 problems!)* . . . . . 63.
Physics *(over 300 problems)* . . . . . 63.
CAMDE ... NCP
Nutricalc *(diet & nutrition analysis)* . . . . . 49.
Nutricalc Plus *(full-featured)* . . . . . 175.
CasadyWare ... NCP
Fluent Fonts *(two-disk set)* . . . . . 28.
Fluent Laser Fonts *(Vols. 1-15)* . . . . . *each* 46.
CE Software ... NCP
Calendar Maker *(create custom calendars)* 27.
Disktop 3.0 *(powerful DA Finder)* . . . . . 32.
QuicKeys *(reduce mouse movements)* . . . . 69.
Challenger Software ... NCP
Mac3D *(3D graphics, CAD features)* . . . . . 127.
Chang Labs ... NCP
Rags to Riches Ledger . . . . . 123.
Rags to Riches Payables . . . . . 123.
Rags to Riches Receivables . . . . . 123.
Rags to Riches Three Pak . . . . . 299.
The C.A.T. *(contacts, activities, time)* . . . . . 239.
Inventory Control . . . . . 239.
Professional Billing . . . . . 239.
Professional Three-Pak . . . . . 389.
Retail Business 3 Pak . . . . . 389.
Concept Development
MicroKitchen Companion . . . . . 29.
America Cooks: American, Chinese, French, Italian or Mexican . . . . . *each* 11.
Cortland ... CP
TopDesk 2.3 *(7 new desk accessories)* . . . . 33.
Cricket Software ... NCP
Statworks *(statistical package)* . . . . . 75.
Pictograph *(color on the Mac II)* . . . . . 105.
Cricket Graph *(multiple windows)* . . . . . 124.
Cricket Draw *(advanced draw capabilities)* 175.
Data Tailor ... NCP
Trapeze *(spreadsheet, reqs. 512k)* . . . . . 159.
DataViz ... NCP
MacLink Plus *(transfer Mac/IBM data)* . . . . 149.

Davidson ... CP
Math Blaster! *(grades 1-6)* . . . . . $27.
Deneba Software ... NCP
Merriam-Webster's Thesaurus . . . . . 36.
Comment *(electronic Post-It notes)* . . . . . 59.
Canvas 1.0 *(includes desk accessory)* . . . . 119.
Digital, etc. ... NCP
Turbo Maccountant *(GL,AP,AR,Payroll)* . . . 255.
Dove Computer ... NCP
RAMSnap *(RAM Disk/Disk Cache)* . . . . . 22.
Dow Jones ... CP
Straight Talk . . . . . 59.
Market Manager Plus . . . . . 159.
Dubl-Click Software ... NCP
Calculator Construction Set. . . . . 37.
World-Class Fonts! *(both volumes)* . . . . . 47.
WetPaint Clip Art *(both volumes)* . . . . . 47.
Electronic Arts ... CP
Deluxe Music Construction Set 2.0 . . . . . 62.
Enabling Technologies ... NCP
Easy3D *(create solid 3D objects)* . . . . . 79.
Pro 3D *(3D shaded modeling)* . . . . . 199.
Enzan-Hoshigumi USA ... NCP
Japanese Clip Art Scroll 1 "Heaven" . . . . . 59.
Japanese Clip Art Scroll 2 "Earth" . . . . . 59.
MacCalligraphy *(create unique designs)* . . . 115.
Fifth Generation Systems ... NCP
FastBack Mac *(powerful backup utility)* . . . . 59.
1st Byte ... CP
Mad Libs *(party time)* . . . . . 14.
First Shapes *(all about sizes & shapes)* . . . . 32.
Kid Talk *("talking notebook")* . . . . . 32.
Math Talk *(math learning tool)* . . . . . 32.
Smooth Talker *(speech synthesis)* . . . . . 32.
Speller Bee *(spelling learning tool)* . . . . . 32.
Forethought ... NCP
Factfinder 1.1 *(information organizer)* . . . . . 39.
FileMaker 1.0 *(custom design reports)* . . . . . 49.
PowerPoint 1.0 *(presentations)* . . . . . 189.
Foundation Publishing ... NCP
Comic People *(create your own characters)* 26.
Comic Strip Factory *(create cartoons)* . . . . . 45.
FWB Software ... NCP
Hard Disk Backup . . . . . 37.
Hard Disk Partition . . . . . 37.
Hard Disk Util *(program backup)* . . . . . 55.
Great Wave Software ... NCP
TimeMasters *(learn about time, ages 4+)* 22.



Forethought ... NCP
PowerPoint 1.0—comprehensive presentation creation tool. Built-in graphics editor, word processor & layout tools . . . . . $189.

Overnight Delivery.



Challenger Software ... NCP
Mac3D–Create complex 2- & 3-dimensional graphics. Optimizes Mac interface making even sophisticated graphics a snap!..... $127.

KidsTime *(educational, ages 3-8)* ..... 27.
Crystal Paint *(graphic symmetries)*..... 32.
ConcertWare+ *(music composition)* ..... 39.
Art of the Fugue, Christmas Favorites,
Classical Selections, Instrumental favorites,
Early Music, Popular Music .....*each* 12.
ConcertWare+ MIDI..... 79.
Greene, Inc. ... NCP
QuickDEX *(address book)* ..... 24.
Hayden Software ... CP
MusicWorks *(songs for your Mac)* ..... 29.
Home Design *(floor planning)*..... 49.
Score Improvement for the SAT..... 58.
Score Improvement for the ACT ..... 58.
Ideaform ... NCP
MacLabeler or DiskQuick..... 28.
Imagine ... NCP
Smart Alarms *(DA reminder system)* ..... 37.
Multi-user Appointment Diary ..... 99.
Infosphere ... CP
LaserServe *(network software)* ..... 64.
ComServe *(NCP, modem sharer)*..... 124.
MacServe *(network software)* ..... 164.
Innovative Data Design ... NCP
MacDraft 1.2A *(requires 512k)*..... 157.
Kensington
Graphic Accents *(250 illustrations)*..... 29.
Professional Type Fonts for Text..... 29.
LaserWare ... CP
LaserWorks *(requires 512k, LaserWriter)*... 195.
LaserPaint *(requires Mac Plus)*..... 315.
Layered ... CP
Notes for...Excel, Microsoft Works, PageMaker,
Ready,Set,Go!3 or Word ..... *each* 41.

Legisoft/Nolo Press ... NCP
WillWriter 2.0 *(prepare your own will)* ..... $30.
Letraset ... NCP
Ready,Set,Go! 4.0 *(page layout)* ..... 289.
Linguist's Software ... NCP
Tech *(1000 different symbols)* ..... 59.
FOREIGN LANGUAGE FONTS
MacCyrillic..... 39.
SuperFrench/German/Spanish..... 39.
MacHieroglyphics, MacKana/Basic Kanji,
MacSemitic/Coptic/Devanagari, MacKorean,
MacThai, SuperGreek, MacHebrew
MacAkkadian..... *each* 59.
SuperGreek New or Old Testament..... 79.
MacHebrew Old Testament..... 79.
LaserFrench/German/Spanish ..... 79.
LaserGreek, LaserHebrew ..... *each* 79.
Laser Transliterator..... 79.
LaserTech ..... 79.
MacGreek/Hebrew/Phonetics..... 89.
LaserCyrillic, MacChinese ..... *each* 115.
Living Videotext ... NCP
More 1.1C *(outlines, windows, & tree charts)* 149.
Lundeen & Associates ... NCP
WorksPlus Spell 1.1 ..... 49.
MacroMind ... NCP
VideoWorks II *(animation tool)* ..... 119.
MacroPac International ... NCP
101 Macros for Excel ..... 45.
Magnum ... CP
Natural Sound Effects..... 27.
McPic Vol. 1 or Vol. 2 ..... 29.
Natural Sound with cable & editor..... 89.
The Slide Show Magician 1.3 ..... 35.
Micro Analyst ... NCP
Mac Zap *(recover crashed hard disks)*..... 39.
Microlytics ... NCP
Word Finder *(synonym finder)* ..... 39.
Microsoft ... NCP
Flight Simulator *(the Mac takes flight, CP)* .. 32.
Basic Interpreter 3.0..... 62.
Chart 1.02 *(42 chart styles, CP)*..... 72.
Multiplan 1.1..... 110.
File 1.05 ..... 110.
Basic Compiler 1.0 ..... 119.
Fortran 2.2 *(compiler)* ..... 169.
Works 1.1 *(integrated tool)*..... 185.
Excel 1.04 *(power spreadsheet)* ..... 224.
Word 3.01 *(word processor)* ..... 239.
Migent ... NCP
In House Accountant *(small business)* .... 119.
Miles Computing ... NCP
Mac the Ripper Vol. 3 *(req. Paint program)*.. 27.
Orchestra of Fonts Vol. 4 *(30 different fonts)* 27.
Peoples, Places & Things Vol. 5..... 27.
Mindscape ... NCP
Crossword Magic..... 30.

The Perfect Score: SAT *(CP)* ..... $47.
ComicWorks *(create your own comics)* .... 47.
GraphicWorks 1.1 *(newsletters)*..... 87.
MindWork Software ... NCP
MindWrite 1.1..... 169.
Monogram ... NCP
Forecast *(tax planning)*..... 40.
Dollars & Sense *(home, small business)*.... 81.
Nantucket ... NCP
McMax *(dBASE III compatible)* ..... 189.
Nashoba Systems ... NCP
FileMaker Plus *(feature-packed database)* 149.
Odesta ... NCP
Double Helix II *(relational, custom menus)* 349.
Multi-User Helix *(requires 512k)*..... 429.
Olduvai Software ... NCP
DA-Switcher *(unlimited desk accessories)* .. 26.



Cricket Software ... NCP
Cricket Graph–Polish up reports with professional graphs. Choose from pie, bar, line, area & more. Supports color on Mac II.. $124.

Post ART *(clip art, 3 disk set)*..... 36.
Icon-It! *(create custom icon bars)*..... 41.
Read-It! *(OCR software for Thunderscan)*... 99.
OWL International ... NCP
Guide *(hypertext, free-form info)* ..... 77.
Guide Envelope System..... 99.
Palantir ... CP
MathFlash *(math flashcard drills)*..... 26.
WordPlay *(over 50 word puzzles)*..... 26.
MacType *(typing instruction)*..... 32.
inTalk *(communication to emulation, NCP)*.. 99.
Passport Designs ... 90 days
Passport MIDI Interface ..... 95.
Mastertracks Pro ..... 259.
PBI Software ... NCP
Icon Business or Fun & Games Library .... 14.
HFS Locater *(DA organizer for HFS)* ..... 26.

1-800/Mac&Lisa 780C

MacConnection™

MEMBER DIRECT MARKETING ASSOCIATION

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 or 603/446-7711

©Copyright 1987 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc.

All items subject to availability. Prices subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion.

Toll-free support.

Patton vs Rommel . . . . . $27.
Skyfox, Seven Cities of Gold,
Archon, Pinball Construction Set,
Dr J vs Larry Bird . . . . . *each* 27.
Chessmaster 2000 . . . . . 29.
Epyx ... CP
Rogue *(strategy dungeon classic!)* . . . . . 15.
Sub Battle Simulator *(NCP)* . . . . . 24.
Winter Games *(Olympic events)* . . . . . 24.
Great Wave Software ... NCP
LOC *(strategy game)* . . . . . 29.
Hayden Software ... CP
Perplexx *(scrabble-type game)* . . . . . 24.
Sargon III *(9 levels of chess)* . . . . . 29.
Infinity Software ... CP
Go *(4000-year-old strategy game)* . . . . . 22.
Grand Slam *(tennis, req. 512k)* . . . . . 27.



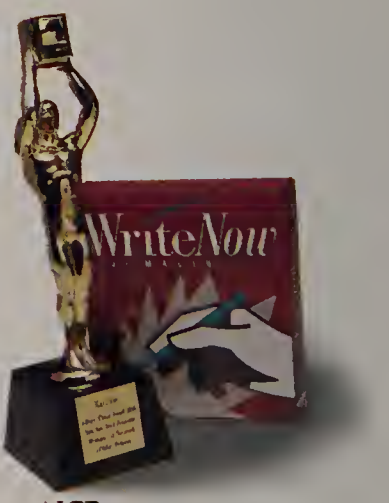
Software Discoveries ... NCP
Record Holder Plus–Flexible, easy-to-use database manager. Search or sort on any field . . . . . $45.

Infocom ... CP
Hitchhiker's Guide to the Galaxy . . . . . 18.
Leather Goddesses, Trinity, Moonmist,
Ballyhoo, Bureaucracy, Stationfall, Nord & Bert,
Lurking Horror, Plundered Hearts,
Hollywood Hyjinx *(standard)* . . . . . *each* 24.
Spellbreaker . . . . . 24.
Zork Trilogy . . . . . 44.
Invisiclues Hint Booklets *(please specify)* . . . 6.
MacroMind ... NCP
Mazewars+ *(play via modem or network)* . . 31.
Miles Computing ... CP
Harrier Strike Mission or Quintette . . . . . 27.
Down Hill Racer *(3D ski simulation)* . . . . . 27.
Fool's Errand *(solve the puzzles)* . . . . . 27.
Mindscape ... NCP
Balance of Power *(world politics)* . . . . . 30.
King of Chicago *(req. minimum 512E)* . . . $30.
Shadowgate *(castle adventure)* . . . . . 30.
Uninvited *(haunted house adventure)* . . . . 30.
Deja Vu *(murder mystery)* . . . . . 30.
Olduvai Software ... NCP
Maze Survival *(action game)* . . . . . 21.
PBI Software ... CP
Strategic Conquest *(multi-user)* . . . . . 35.
Primera Software ... CP
Smash Hit Racquetball *(top-rated!)* . . . . . 15.
Psion ... CP
Psion Chess *(3D and multi-lingual)* . . . . . 31.
Rainbird ... CP
Pawn *(text-graphics adventure)* . . . . . 27.
Sierra On-Line ... CP
Leisure Suit Larry *(swinging single life)* . . . . 24.
King's Quest I, II or III . . . . . 30.
Space Quest . . . . . 30.
Silicon Beach Software
Airborne! *(CP, the classic!)* . . . . . 20.
Enchanted Scepters *(CP, over 200 scenes)* 21.
Dark Castle *(NCP, arcade action)* . . . . . 27.
World Builder *(NCP, program creator)* . . . . . 41.
Simon & Schuster ... CP
Star Trek—The Kobayashi Adventure . . . . . 24.
Sir-Tech ... CP
Mac Wizardry *(high-rated fantasy)* . . . . . 35.
SPHERE, Inc. ... NCP
Tellstar II *(No. & So. hemispheres, req. 512k)* 15.
GATO *(submarine simulator)* . . . . . 26.
Orbiter *(space shuttle simulation)* . . . . . 26.
XOR ... NCP
NFL Challenge *(be the coach!)* . . . . . 65.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.
NOTE: Some hardware items are available in either platinum or beige color. Please specify.

20 Megabyte SCSI Hard Drive . . . . . 529.
45 Megabyte SCSI Hard Drive . . . . . 1039.
Apricorn ... 1 year
ApriCord Mac *(for Mac 512k or Mac Plus)* 75.
AST Research ... 6 months
AST 2000 . . . . . 1395.
AST TurboScan *(300 dpi scanner)* . . . . . 1389.
AST TurboLaser P/S . . . . . 2995.
Curtis Manufacturing ... lifetime
SURGE SUPPRESSORS
Safestrip *(6 outlets)* . . . . . 21.
Diamond *(6 outlets)* . . . . . 29.
Emerald *(6 outlets; 6 ft cord)* . . . . . 36.
Sapphire *(3 outlets; EMI/RFI filtered)* . . . . . 47.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* $55.
Dove Computer ... 90 days
Toolkit *(clamp torx driver & wrist strap)* . . . . 15.
SCSI Interface/Port . . . . . 125.
MacSnap 524 *(512k to 1 Meg)* . . . . . 139.
MacSnap 524S *(512E to 1 Meg w/SCSI)* . . 239.
MacSnap 548 *(512k to 2 Meg)* . . . . . 369.
MacSnap 548S *(512E to 2 Meg w/SCSI)* . . 469.
MacSnap 2S *(1 Meg to 2.5 Meg)* . . . . . 489.
MacSnap 4S *(1 Meg to 4 Meg)* . . . . . 969.
MacSnap 8S *(for Mac II, to 8 Meg)* . . . . . 1939.
MacSnap Plus 2 *(MacPlus to 2 Meg)* . . . . . 249.
MacSnap Plus 4H *(MacPlus to 4 Meg)* . . . 969.
Ergotron ... 1 year
Mouse Cleaner 360° . . . . . 15.
MacTilt or MacTilt SE . . . . . 69.
MacTilt *(for large monitor)* . . . . . 89.
MacBuffer 512k . . . . . 329.
MacBuffer 1024k . . . . . 429.
Farallon Computing ... 1 year
PhoneNET-AppleTalk 120 . . . . . 9.
PhoneNET PLUS *(DB-9 or DIN-8)* . . . . . 45.
General Computer
Personal Laser Printer . . . . . 1995.
Hayes ... 2 years
Smartcom II *(communications software)* . . 88.
Smartmodem 1200 . . . . . 299.
Smartmodem 2400 . . . . . 449.
MacPlus 1200 Package . . . . . 399.
MacPlus 2400 Package . . . . . 549.
Kensington ... 1 year
Appletalk Cable Clips or Connectors . . *each* 1.
External Drive Cover . . . . . 8.
Mouseway *(mouse tracking pad)* . . . . . 8.



T/Maker ... NCP
WriteNow–MacUser 1986 Best New Word Processor. Multiple windows & columns, footnotes, & 50,000 word spell checker . . $99.

1-800/Mac&Lisa 780C

MacConnection™

MEMBER DIRECT MARKETING ASSOCIATION

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 or 603/446-7711

©Copyright 1987 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc.

All items subject to availability. Prices subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion.

No hidden charges.

Kensington *(continued)*
Mouse Pocket *(for your idle mouse)* . . . . . $8.
Mac Plus/Mac SE Cover . . . . . 9.
Imagewriter II Dust Cover . . . . . 9.
Printer Stand . . . . . 17.
Mouse Cleaning Kit w/Mouse Pocket . . . . . 17.
Disk Drive Cleaning Kit . . . . . 20.
Tilt/Swivel . . . . . 22.
Universal Copy Stand . . . . . 23.
Polarizing Filter or Surge Suppressor . . . . . 34.
Apple Security Kit . . . . . 34.
Printer Muffler *(80 column)*. . . . . 38.
Printer Muffler *(132 column)* . . . . . 51.
Printer Muffler Stand *(80 or 132 column)* . . 25.
A-B Box *(for the Mac Plus)* . . . . . 64.
System Saver Mac or Control Center . . . . . 64.
Turbo Mouse *(for the MacPlus & SE)* . . . . . 83.
Koala Technologies ... 90 days
MacVision *(digitizer, includes MoreVision)* 175.
Kraft Systems ... 1 year
3 Button QuickStick . . . . . 54.
Migent ... 1 year
Pocket Modem *(ext. 300/1200 baud)* . . . . 169.
Mirror Technologies ... 1 year
Magnum 800 External Drive *(platinum)* . . 209.
Magnum Tape 40 Backup . . . . . 1079.
MagNet 30x *(w/cable & print spoolers)* . . 799.
MagNet 40x *(w/cable & print spoolers)*. . 1079.
MagNet 40/40 *(40 Meg, 40 Meg tape)* . . 2139.
MSC Technologies ... lifetime
A+ Mouse *(optical mouse)* . . . . . 79.
Nuvotech ... 1 year
EasyNet *(AppleTalk network connector)*. . . 28.
Orange Micro ... 1 year
Grappler *(universal parallel interface)* . . . . . 69.
Personal Computer Peripherals ... 2 years
MacBottom HD 21 Meg *(SCSI)*. . . . . 749.
MacBottom HD 32 Meg *(SCSI)* . . . . . 899.
MacBottom HD 45 Meg *(SCSI)*. . . . . 1159.
Optional built-in 1200 bps modems avail. call
MacBottom IHD-144 Meg *(for Mac II; 1 yr.)* 2195.
Practical Peripherals ... 5 years
1200 Baud External Modem . . . . . 109.
2400 Baud External Modem . . . . . 189.
SoftStyle ... 90 days
MacEnhancer *(for plotters to printers)*. . . . 159.
Summagraphics ... 90 days
MacTablet 6″ x 9″ *(sketching)*. . . . . 289.



Kraft Systems ... 1 year
3 Button QuickStick–Cruise across columns, careen around corners, and have more all around fun. Great for games, too!. . . . . $54.

MacTablet 12″ x 12″. . . . . $379.
Systems Control ... 2 years
MacGard *(surge protection)*. . . . . 55.
Thunderware ... 90 days
ThunderScan 4.0 with PowerPort. . . . . 199.
Mac II Power Accessory. . . . . 42.
Western Automation
DASCH RAMdisk 2000K . . . . . 399.

DISKS

Double-sided diskettes.
Sony 3½″ DS/DD Disks *(box of 10)* . . . . . 18.
MAXELL 3½″ DS/DD Disks *(box of 10)* . . . 20.
Fuji 3½″ DS/DD Disks *(box of 10)* . . . . . 20.
Verbatim 3½″ DS/DD Disks *(box of 10)*. . . 20.
3M 3½″ DS/DD Disks *(box of 10)*. . . . . 20.

Single-sided diskettes.
Sony 3½″ SS/DD Disks *(box of 10)* . . . . . 13.
Fuji 3½″ SS/DD Disks *(box of 10)* . . . . . 13.
MAXELL 3½″ SS/DD Disks *(box of 10)* . . . 14.
Verbatim 3½″ SS/DD Disks *(box of 10)* . . . 15.
3M 3½″ SS/DD Disks *(box of 10)* . . . . . 15.



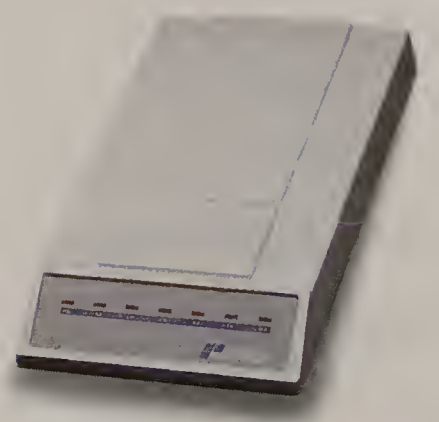
Dove Computer ... 90 days
MacSnap 548–Increase your Mac 512k's memory to a full 2 Meg. User installable $369.

INFORMATION SERVICES

CompuServe Information Service. . . . . 24.
Dow Jones News/Retrieval Membership Kit 24.

ACCESSORIES

Clean Image Ribbon Co.
Clean Image Ribbon Kit . . . . . 12.
Computer Coverup
External 800k Drive Cover . . . . . 4.
Imagewriter II Cover . . . . . 8.
Mac Plus & Keyboard *(two covers)*. . . . . 10.
I/O Design
Imageware II *(Imagewriter II carry case)* . . . . 45.
Macinware Plus *(Mac Plus carry case)* . . . . . 65.
Macinware SE *(Mac SE carry case)* . . . . . 75.
Macinware SE/Imageware II . . . . . 105.
Available in navy or platinum.
Kalmar Designs
Teakwood Roll-top Case *(holds 45 disks)* . . . 14.
Teakwood Roll-top Case *(holds 90 disks)* . . . 20.
Teakwood Roll-top Case *(holds 135 disks)* . . 28.



Practical Peripherals ... 5 years
External Modems–100 percent Hayes compatible. Feature "automatic adaptive equalization."
1200 bps . . . . . $109.
2400 bps . . . . . $189.

Magnum
Mouse Mover *(let your mouse ride!)* . . . . . 14.
Moustrak
Moustrak Pad *(standard 7″ x 9″)* . . . . . 8.
Moustrak Pad *(large 9″ x 11″)* . . . . . 9.
Available in black, blue, brown, gray, green, plum, and red.
Ribbons Unlimited
Imagewriter Ribbons . . . . . 5.
Available colors: black, blue, brown, green, orange, purple, red, yellow and silver.
Rainbow Pack *(6 single color ribbons)* . . . . . 25.
Four Color Ribbon *(requires Imagewriter II)* 11.
Sensible Softworks
Quality "MacAttire" nylon dust covers. . . . 7-17.
High Trek Imagewriter II carry case . . . . . 49.
High Trek Mac SE & ext. kybd. carry case 69.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders usually shipped 1st Class Mail.
- Allow 1 week for personal and company checks to clear.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders phoned into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now $3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery. **Hawaii, Alaska and Outside Continental US:** Call 603/446-7711 for information.

Reviews



Power PostScript Printing

Varityper VT600

Laser printer. ***Pros:*** *Excellent performance and print quality; hard disk for storing fonts.* ***Cons:*** *Expensive; Adobe Times and Helvetica fonts not included.* ***List price:*** *$18,750.* ***Requires:*** *512K, AppleTalk or compatible connectors and cables.*

Wow is likely to be your reaction to the performance of Varityper's VT600 laser printer, which boasts the kind of vital statistics that give desktop publishers goosebumps. It turns out ten pages per minute with 600-dots-per-inch (dpi) resolution (twice as much as most laser printers) under the direction of an Adobe Atlas controller, which contains a 68020 microprocessor running at 16 MHz, 6 megabytes of memory, and a 20MB hard disk.

A hefty 161 pounds, the VT600 outweighs the LaserWriter by 84 pounds and is about the size of a small office copier. It must be set up by a Varityper service representative, who installs the polished drum assembly that transfers toner to paper, fills the toner hopper, and prepares the print mechanism for its maiden voyage.

Interfaces and Typefaces

The VT600 contains three standard interfaces–AppleTalk, RS-232C serial, and Centronics parallel–and provides a rotary switch for choosing among them. Unlike most PostScript printers, the VT600 lacks a Diablo 630 emulation mode. That isn't important, however, when you consider this printer's typesetting bent; you'd be crazy to use a VT600 to imitate a daisy wheel.

The VT600's type drawer isn't as well stocked as some PostScript printers. The printer's ROM contains three font families: Varitimes (a version of Times Roman), Courier, and Symbol. The hard disk holds the Aristocrat family (Varityper's rendition of Helvetica). A floppy disk is included containing screen versions of all the fonts.

This font mix presents a problem for Mac users. Because the Mac's LaserPrep file expects to find fonts named Helvetica and Times Roman, it displays an error message every time the printer is initialized, even if those fonts don't appear in the document. Worse, Aristocrat and Varitimes aren't identical matches for Adobe's Helvetica and Times, which makes it impossible to print proofs of documents destined for the VT600 on a LaserWriter.

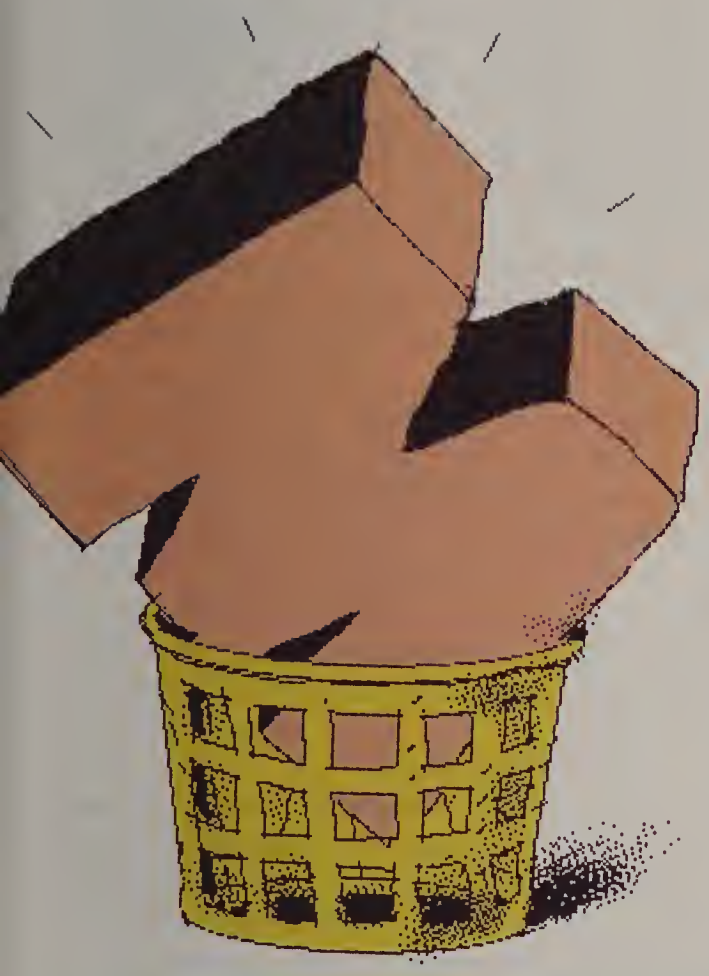
There is a solution, but it'll cost you: Varityper sells downloadable versions of Adobe's Times and Helvetica fonts for $190 each. The firm is negotiating with Adobe and Merganthaler (which owns the rights to Helvetica and Times Roman) to include those fonts with the printer, but at this writing, no agreement had been reached.

Technical Wizardry

The VT600's controller was designed with performance in mind. One example is its approach to downloadable fonts. On LaserWriter-class printers, downloadable fonts are stored on a Macintosh floppy or hard disk and downloaded to the printer over the AppleTalk network. The VT600, however, can store roughly 100 downloadable fonts on its own hard disk.

Half of the VT600's hard disk is reserved for downloadable fonts. The other 10MB have been set aside as a supplement for the printer's *font cache,* an area of memory that holds the bit-mapped representations of the characters that have been printed on a page. The bigger the font cache, the faster the printer handles typographically complex documents. (For more details on how PostScript printers work, see "Laser Wars," *Macworld,* June 1987.)

When the VT600's font cache fills, the controller saves the least recently used character bit maps on the hard disk. Retrieving characters from the hard disk takes longer than retrieving them from memory, but it's faster than rebuilding them from scratch.



The end result is stunning performance. In my tests, the VT600 was at least twice as fast as the QMS PS-800 Plus, which is two to four times faster than a LaserWriter (see "Lasers at a Glance"). That's especially impressive when you consider that the VT600 must manipulate four times the amount of memory to create a single page.

And the VT600's output is beautiful. Small type is tack sharp, and you almost need a magnifying glass to see any jaggies on large text. Hairline rules are fine and delicate; at 1/600 inch, they're half as wide as LaserWriter hairlines. Black areas also print beautifully, with no visible scan lines. The printer owes its sharpness in part to the fineness of its toner; one particle of it measures a scant 8 microns (eight millionths of a meter), versus the LaserWriter's 14-micron toner.

The Price of Power

While your heart will soar at the sight of the VT600's output, it will sink at its price. At $18,750, the VT600 is the printer for the rich of us. But Varityper denies that the VT600 is a laser printer, preferring to call it a "plain paper typesetter," aimed at high-volume desktop publishers, quick-printing outlets, and newspapers. From that point of view, it's a bargain. Its closest competitor, Linotype's 1270-dpi Linotronic 100, goes for $32,000. For many applications, the extra cost and the hassles of working with photographic paper and chemicals aren't worth the increased resolution.–*Jim Heid*

See *Where to Buy* for product details.

Lasers at a Glance

Specifications	QMS PS-800 Plus	Varityper VT600
Amount of RAM	2MB	6MB
Amount of ROM	1MB	0.64MB
PostScript version in unit tested	44	48
Microprocessor in printer controller	68000	68020
Built-in fonts	35	13
Free memory available at start-up	410,754 bytes	1,355,224 bytes
Size of font cache	279K	10K[1]
Number of paper cassettes	1	1
Maximum paper size	8½ by 14 in.	8½ by 14 in.
Capacity of paper cassette	100 sheets	200 sheets
Engine duty cycle	3000 pages/month	3000 pages/month
Writes white or black	black	black
Interfaces[2]	A, R	A, R, C
Emulation modes	Diablo 630	none
List price	$5495	$13,500
Performance		
Initialize and print *Word* document (16K)	03:47 min.	01:50 min.
Print *MacDraw* document (2922 objects)	08:20 min.	03:21 min.

[1]Hard-disk-based font cache.
[2]A stands for AppleTalk; R, *for RS-232C serial;* C, *for Centronics parallel.*

A comparison of Varityper's VT600 and QMS's PS-800 Plus. For specifications and test results of other PostScript printers, see "Laser Wars" in the June 1987 issue of Macworld.

Because the World Is Round

Dimensions *1.18*

3-D design and solid-surface modeler. ***Pros:*** *Fast, easy creation and editing of 3-D images; allows simultaneous work on up to 16 windows; extensive support of high-resolution output devices.* ***Cons:*** *Documentation hard to follow.* ***List price:*** Design Dimensions *$750 black-and-white, $1395 color;* Solid Dimensions *$395 black-and-white, $1295 color; both programs $2495 color;* DXF Transfer *$495; demo disks $25 black-and-white, $39 color.* ***Requires:*** *1MB.* ***Copy protection:*** *None.*



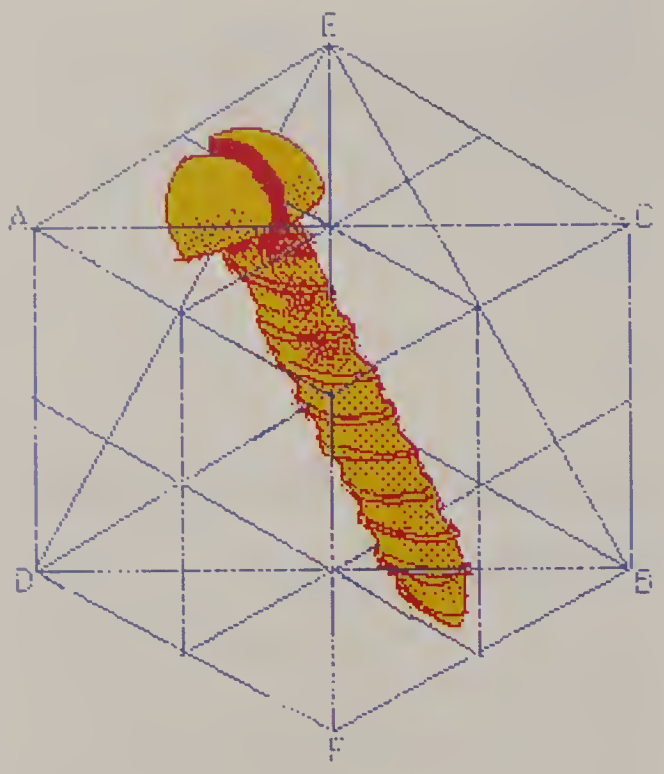
Dimensions, from Visual Information, provides an excellent set of tools for realistically visualizing 3-D objects–complete with shading, color, and highlights. This new package consists of two separately available programs: *Design Dimensions,* which allows you to create and manipulate wire-frame, polygon-filled, and shaded 3-D representations of objects; and *Solid Dimensions,* a full-blown solid-surface modeler that uses sophisticated rendering and ray-tracing techniques to turn 3-D wire-frame representations into beautifully shaded images of solid objects.

With *Dimensions,* you can visualize objects as small as a screw or as large as a space station. It's also effective for creating the high-quality logos seen on television or for producing illustrations for advertising and technical manuals. Architects can even use *Dimensions* to produce full-color, full-perspective renderings of floor plans and elevations.

In and Out

Although *Dimensions* can produce shaded black-and-white 3-D renderings, you will best appreciate this program on a color screen. For testing both modes, I used a black-and-white Mac SE and a "full-

ILLUSTRATIONS BY MARK ULRICH



house" Mac II with 8 megabytes of RAM, an extended video card, a 13-inch Apple color monitor, and a 19-inch SuperMac monitor and color board.

Dimensions makes possible ultra-high resolution and precise color beyond the reproduction quality you get from the LaserWriter or the color ImageWriter II. While you can create, store, and display detailed color images with the Mac's standard printers, for the best hard copy you'll need fancier color plotters or printers. Fortunately, there are drivers that take full advantage of *Dimension*'s special capabilities: creation of graphics on up to C-size paper (17 by 22 inches); of magnificent (8 ½- by 11-inch) color prints or overhead transparencies; and of 35mm slides of 4096 by 2730 pixels, all with 16.8 million colors available.

There are numerous ways of getting data into and out of *Dimensions*. For example, an optional bidirectional *DXF Transfer* module imports and exports files to and from *AutoCAD* and other PC-based CAD systems in the DXF format. Via a process called *meshing, Dimensions* also creates other files that can be fed to *MSC/pal,* a finite element analysis program for the Mac from MacNeal Schwendler. *MSC/pal* performs stress and vibration analysis on 3-D designs. *Dimensions* is also PICT- and Clipboard-compatible, so the 3-D images it creates can be sent to a variety of other Mac packages, including those used for desktop publishing.

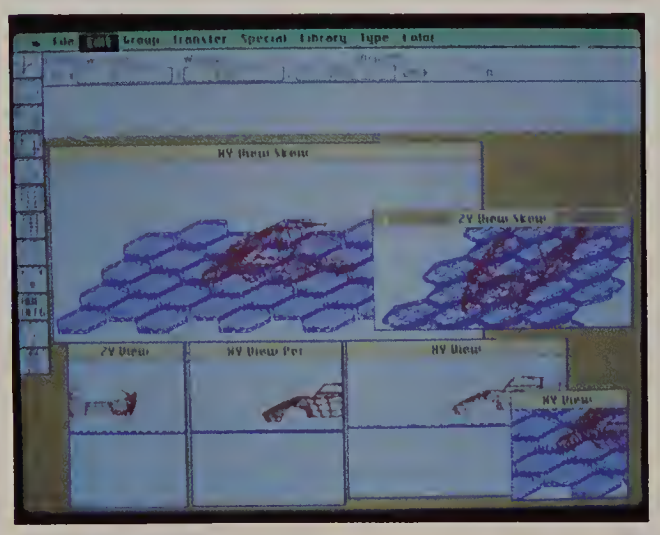
Dimensions in Depth

Dimensions is so rich in features and capabilities that you can't expect to master it quickly. Its extensive manual contains tutorials and explanations of concepts, but it's hard to follow. A new version with an index and table of contents is to be issued soon. *Dimensions* also comes with tutorials in the form of helpful "slide show" files on disk. In spite of the documentation's deficiencies, I was able to do a 3-D design in my first session after running through the tutorials. Visual Information also offers training courses in which you learn the intricacies of *Dimensions* from an actual instructor.

Design Dimensions presents you with up to 16 view windows (see "Open Windows") and numerous built-in facilities for creating lines, double lines, splines (with variable tension), and free-form curved surfaces. You can key in *x, y,* and *z* coordinates as well.

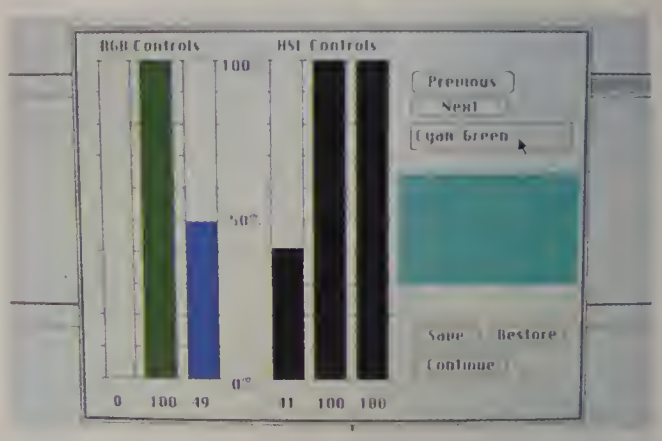
You switch colors through a pull-down menu that displays color bars, each of which you can alter to match any of the 16.8 million possible colors. To do this without being overwhelmed by hundreds of color choices on the screen, you use a sliding-bar control screen to visually modify the red, green, and blue content of colors, as well as their hue, saturation, and luminance (see "Color Control").

To speed up construction of complex objects, elements can be grouped and then copied, flipped, rotated, and even colored. You can store groups as symbols and recall them for additional use on new designs.



Open Windows

With Design Dimensions *you can open additional windows to work more easily on a 3-D design. Shown here are 6 (of a maximum of 16) open windows. As you drag the cursor from one window to the next, it automatically becomes active in that window. Each window can be made to show the design at different scales and orientations, and any window can vary in size.*



Color Control

Dealing with a choice of 16.8 million colors is easy with this color-control panel, used by both Design Dimensions *and* Solid Dimensions. *The panel permits you to independently vary a color's red, green, and blue content, as well as its hue, saturation, and luminance. The color box instantly shows you the adjusted color.*

Panning and zooming are accomplished through other sets of built-in facilities.

Moving Visuals

At any time during the design process, *Design Dimensions* can rotate a 3-D image on any of its three axes. Upon command, the system creates a replay file of rotated images in wire-frame, filled-polygon, or shaded form. Playing this back later produces a poor man's "animation" of the object.

Once you are satisfied with a design, you store it and then use *Solid Dimensions* to call it up again. *Solid Dimensions* presents different multiple orthographic windows from those in *Design Dimensions.*

The *Solid Dimensions* windows incorporate a *line of sight* bar that allows you to position the eye location and direction of viewing in three dimensions. When you move the line of sight, the resulting perspective view appears almost instantly in a third window. And this is only the beginning. *Solid Dimensions* takes the perspective view and renders it as a full-color solid with graduated shading and highlighting. You also have a number of lighting options. And with the addition of soon-to-be-released *Combine, Between,* and *Animate* modules, *Dimensions* will have a real-time animation capability of ten frames per second.

The ray-traced, full-color images *Solid Dimensions* generates rival those produced on engineering workstations or mainframe-based systems. *Dimensions* puts the Mac II's speed and graphics capabilities to excellent use.—*David L. Peltz*

See *Where to Buy* for product details.

Freedom from the Mouse

***QuicKeys** 1.0*

Control Panel macro utility. ***Pros:*** *Powerful, flexible, easy to use; application-specific macros can be separate from main System set; different sets can be easily loaded from within an application.* ***Cons:*** *Quick Access application interface is confusing.* ***List price:*** *$99.95.*
Requires: *512KE System 4.1 or higher.*
Copy protection: *None.*

Some Macintosh owners secretly agree with proponents of the IBM PC that a mouse is not always the most efficient tool. True, a few excellent macro programs available for the Mac offer a solution–most notably *Tempo* from Affinity Systems–but many people shy away from them because they seem too complicated. Now there's *QuicKeys* from CE Software, which simplifies defining a keystroke to perform actions normally accomplished with the mouse.

With *QuicKeys* you can easily assign ⌘-key equivalents to menu items without having to use *ResEdit*. Consequently, you can drag windows around, have text typed automatically, or scroll the contents of any window up and down, left and right, a line at a time, or a page at a time–all by using the keyboard. *QuicKeys* also lets you launch applications or documents just by hitting a single key, which means you can bypass the Finder completely.

Each System you run can have up to 100 QuicKeys installed, known collectively as the Universal set. You can also create an additional 100 QuicKeys for each application you use. When you invoke the Quick Reference QuicKey, it lists your Universal set on the screen. CE Software even provides drivers that allow you to print a template of your QuicKeys for reference positioning on your keyboard.

The utility comes with the Quick Access application for editing your keys, sample QuicKey sets, and printing templates. It also includes Init files for accessing alternative keyboards and the DialogKeys Init, for using the keyboard to click on the Open, Save, and Cancel buttons from within standard files.

Snappy Setup

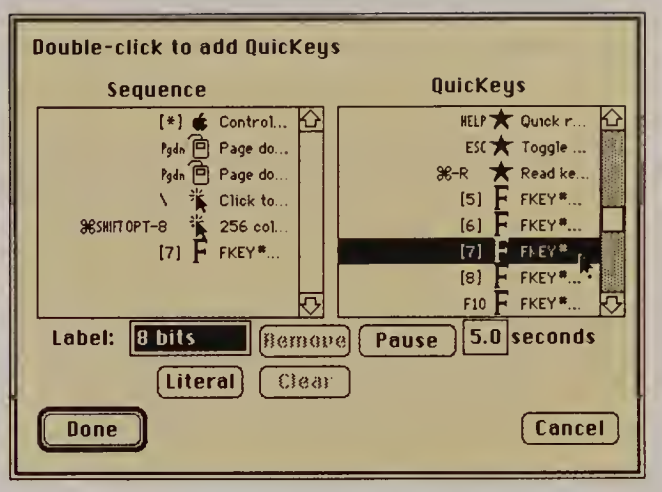
All this versatility wouldn't mean much if the program weren't easy to set up and use. Fortunately, it's a Control Panel device (cdev), so all you have to do is put the program into your System Folder. The next time you open the Control Panel (after rebooting), the *QuicKeys* icon appears along with the other cdev icons.

Once in the Control Panel, you select *QuicKeys,* and a scrollable window appears. Click on Define, and a hierarchical menu pops up with a list of available functions. Some of the choices in the Define menu, such as zooming, closing, or toggling between open windows, are programmed for you. When you select one of these functions, it is immediately highlighted in the *QuicKeys* window, ready to be assigned a key.

Some of the other functions, however, bring up more windows or dialog boxes when selected. For instance, selecting Clicks brings up a dialog box that prompts you to click on a location, then drag. After you perform the operation, you'll see another dialog box that allows further customizing. If you choose File, you can select any application or document, which will then appear in the *QuicKeys* window. After that, every time you hit the assigned key, you launch that file. If you select Menu/DA, you're asked to choose an item from the menu. Assign that item a keyboard command, and you can call it up with that keystroke.

The Power of Sequences

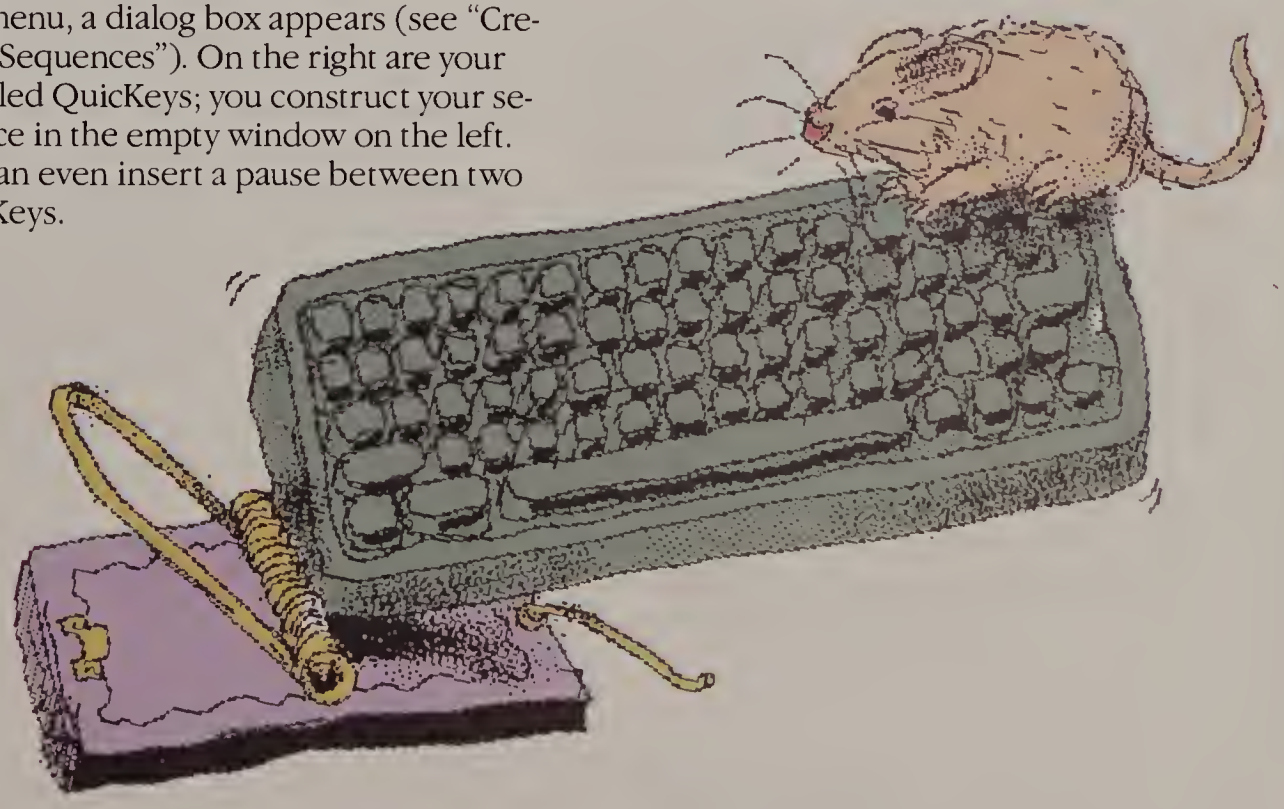
Sequences is a powerful function under the Define menu that allows you to group together single QuicKeys, then assign a single keystroke to the sequence. When you select sequences from the Define menu, a dialog box appears (see "Creating Sequences"). On the right are your installed QuicKeys; you construct your sequence in the empty window on the left. You can even insert a pause between two QuicKeys.



Creating Sequences
A team of QuicKeys can easily be grouped together using the Sequences function. The first key of this sequence opens the Control Panel; the next two scroll down to the Monitor cdev; the fourth selects the Monitor icon; the fifth key performs a click on 256, which changes this Mac II to 8-bit color mode; and the last is a function key that closes all open desk accessories. Merely pressing ⌘-8 runs the entire sequence.

Accessing Keys

Quick Access is a terrific *QuicKeys* application that not only lets you edit sequences but also provides complete editing control over all QuicKeys. It lets you open your Universal set–or any of your application sets–edit them, save the sets in separate files for safety and future reference, and then install them right back into *QuicKeys.* You can later open a saved *QuicKeys* file at any time (from anywhere) and temporarily use a whole other set of keys. Using Quick Access for the first time can be slightly confusing, but the excellent manual clearly explains how to use it.



Magic at Your Fingertips

QuicKeys has become indispensable to me. Granted, this product really comes into its own with the Extended keyboard, but Mac Plus owners can benefit from it as well. You can use it for simple functions, like calling up your favorite DA from the keyboard, or you can totally customize your Mac environment by filling your hard disk with thousands of QuicKeys.

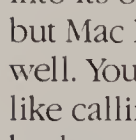
Taking into account the incredible utility it provides, along with the extra goodies you get when you buy it, *QuicKeys* is a fine value. It can accomplish almost everything you want from a macro program without sacrificing power for ease of use. *–Rob Hahn*

See *Where to Buy* for product details.

Heavy-Duty Design

***PowerTools** 1.3*

Software analysis and design tools. ***Pros:*** *Well-crafted set of professional tools; integrated to cover analysis, design, and coding processes.* ***Cons:*** *Expensive; presently limited to traditional, single-task applications; inadequate manual.* ***List price:*** *Complete set $3295; individual modules: FreeFlow $1895; PowerPDL $995; SmartChart $1495.* ***Requires:*** *512K.* ***Copy protection:*** *Key disk; installs on hard disk.*



Originally sold as *Prism, PowerTools* is a set of three integrated modules for software analysis and design: FreeFlow, PowerPDL, and SmartChart. Although the modules may be purchased separately, used by themselves they are of limited value, with the exception of FreeFlow. Together, though, this powerful trio can help you through the major stages of a software development project, from analysis to program coding.

PowerTools is as easy to use as the Mac interface, but without a hard disk it won't be as practical. Because you're likely to create large data files, the modules are inconvenient to run on floppy disks. Also, since data is kept in memory, larger projects may require 1 megabyte of memory.



Interactive Data-Flow Diagrams

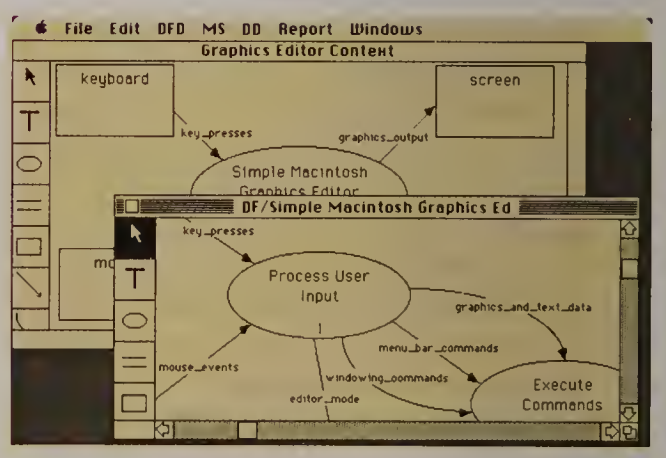
Systems analysts use data-flow diagrams to analyze operational systems, illustrating how information is used and modified as it moves through the many processes of designing a system. By refining these diagrams, the analyst creates a functional model of the system, which can then be expressed as a computer program.

FreeFlow, the first module in the *PowerTools* series, is an interactive data-flow diagram editor. Keeping diagrams on the Mac greatly simplifies the task of creating and maintaining them (see "Free Flowing"). FreeFlow includes a data dictionary for tracking the many names of processes, flows, stores, and terminators used in a diagram. In addition, several checking functions help prevent conflicts, unattached flows, or multiple definitions.

Pseudocode and Structure Charts

Using the pseudocode editor in FreeFlow, you complete an analysis by describing its primitive processes. These "minispecs" are then combined into a single pseudocode file, which is read by the second *PowerTools* module, PowerPDL, which then creates additional documentation from the pseudocode as well as a special structure file for use by SmartChart, the third module.

SmartChart is a language-sensitive editor that uses the structure file created by PowerPDL to display a structure chart of the program. Using the structure chart as a navigational aid, you can quickly locate various procedures and functions within the code file and keep track of calling hierarchies (see "Charts with Smarts").



Free Flowing

The data-flow diagram shown here is the explosion of the main process from the Simple Macintosh Graphics Editor example. Data is indicated by arrows, while ovals indicate processes. The two processes in the front window may be further decomposed through a similar set of explosions.

You write the program source within the structure of the pseudocode file previously created by FreeFlow; all the pseudocode is then transformed into program comments. As long as you maintain these comments while changing the program, you can regenerate the structure chart. Keeping the chart current with the program code makes it easy to keep documentation up to date.

Managing Code and Data

FreeFlow is probably the most useful of the programs, particularly as an analysis tool. Its data dictionary and data-checking functions simplify life considerably. Unfortunately, the lack of a browse feature makes maintaining the data dictionary cumbersome.

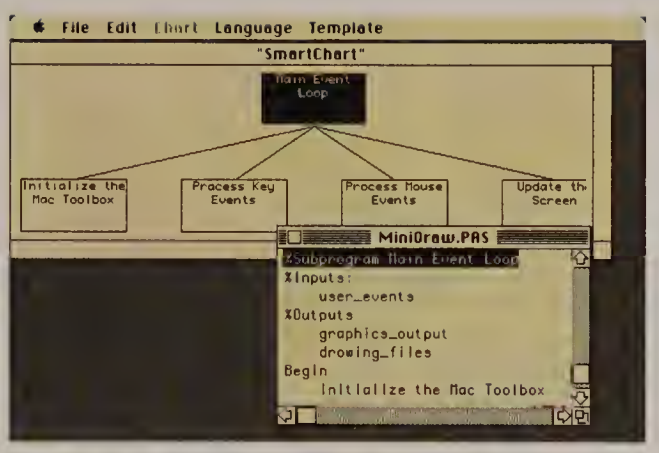
As a language-sensitive program editor, SmartChart is useful for writing code in most structured languages. A number of language-specific program structures, such as IF-THEN-ELSE or BEGIN-AGAIN forms, can be inserted into a program source by selecting them from a template menu. You can configure the editor to present templates specific to a number of popular languages, including Pascal, C, and Ada. Iconix also offers templates for other structured languages.

Although the structure-chart function of SmartChart is useful, it's limited to navigation—you can't edit or create structure charts as you can data-flow diagrams. Neither does it show the current data couples (the parameters passed) between procedures, but Iconix plans to add this feature.

To generate structure charts with SmartChart, you need PowerPDL. Without it, SmartChart is merely a language-sensitive editor. The value of SmartChart and PowerPDL lies in their combined ability to maintain the documentation of a programming project; FreeFlow, on the other hand, works well as an independent tool.

Recommended, within Limits

For experienced professional systems analysts, programmer-analysts, and software engineers working on complex software projects, *PowerTools* is an excellent design aid. Compared to similar systems running on minicomputers or mainframes, it provides comparable power at a fraction of the cost. At present, however, *PowerTools* is limited to traditional programming applications. The tools of real-time analysis, such as state-transition and control-flow diagrams, are not yet available.



Charts with Smarts

The structure chart is shown in the background, while the foreground shows the pseudocode for the corresponding subroutine. Subroutines are quickly located by double-clicking on the appropriate function box in the SmartChart window.

The manual is not easy to use, either as a tutorial or as a reference. Figuring out how to use the modules is difficult, and finding information on what the features do and how they work is even harder. In addition, the sections for each of the modules appear to have been written independently of each other, so their interrelationships are not made clear.

Finally, *PowerTools'* high price puts it beyond the range of most independent programmers working on small projects. But for professionals involved in large, complex programs involving many programmers, it is invaluable.—*Ken Takara*

See *Where to Buy* for product details.

A Graphics Workhorse

Canvas *1.02*

Graphics program. ***Pros:*** *Includes desk accessory version; offers high-resolution bit-map editing.* ***Cons:*** *Incomplete documentation.* ***List price:*** *$195.* ***Requires:*** *512KE, System 4.1 or later; external drive or hard disk recommended.* ***Copy protection:*** *None.*



A number of Macintosh graphics programs, such as *SuperPaint* and *GraphicWorks,* integrate the object-oriented graphics of *MacDraw* and the bit-mapped graphics of *MacPaint.* But they accomplish that by adding some *MacDraw* features to what are basically paint programs. *Canvas,* from Deneba Systems (creator of the *MacLightning, Voila,* and *Memorandum* desk accessories), truly brings together these two independent worlds and adds features to both—including the option to run the program as a desk accessory.

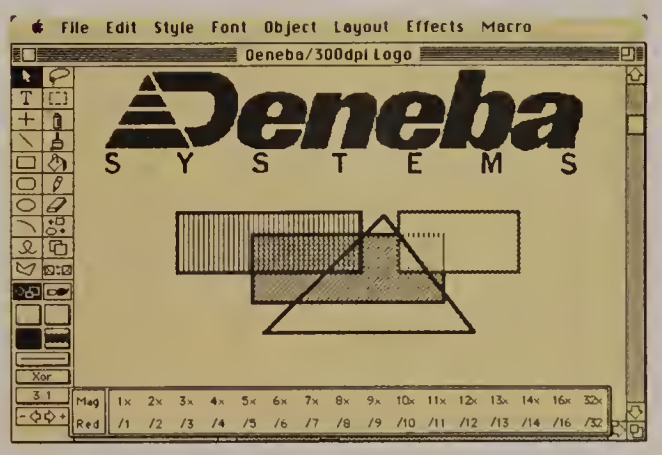
Set Up Your Easel

While most of the tools you see when you open *Canvas* are familiar to users of *MacDraw* and *MacPaint,* there are seven buttons at the bottom of the *Canvas* palette that present pop-up menus of pen and fill patterns, colors, line weights and types, transfer modes, and zoom ratios (see "Pop-up"). These menus not only display their current settings but also allow you to change settings quickly.

Unlike *SuperPaint,* which uses two separate planes for PICT and bit-mapped graphics, *Canvas* lets you work on one plane. You have the option to define an image in draw, paint, or high-resolution paint format, and can mix those formats to any degree in a single document. You can also embed PostScript commands.

After the object is created, changing its type, line and fill patterns, scale, and exact location on the page is easy. To change a rectangle to a paint object, click the check box next to Bitmap and use the pop-up menu next to it to set the resolution—from 72 dots per inch (dpi) to the LaserWriter's 300 dpi or even the Linotronic 300 Imagesetter's 2540 dpi.

To paint in a newly defined paint object, just double-click on it, and *Canvas* switches to painting mode. Inside the boundaries of the paint object, the painting tools are activated and operate at the ob-



Pop-up

With the Magnification pop-up menu, you can quickly magnify or reduce your view of an object on screen. This example shows overlapping objects with different transfer modes.

ject's resolution. *Canvas*'s almost unlimited zoom capability makes editing any paint object easy, and the ability to edit 300-dpi graphics is a boon if you use a scanner. But bit-mapped graphics have ravenous appetites—a 1-inch-square bit map at 2540 dpi takes 788K of memory—so don't expect to edit large, high-resolution bit maps unless your Mac has lots of RAM.

Objects of Admiration

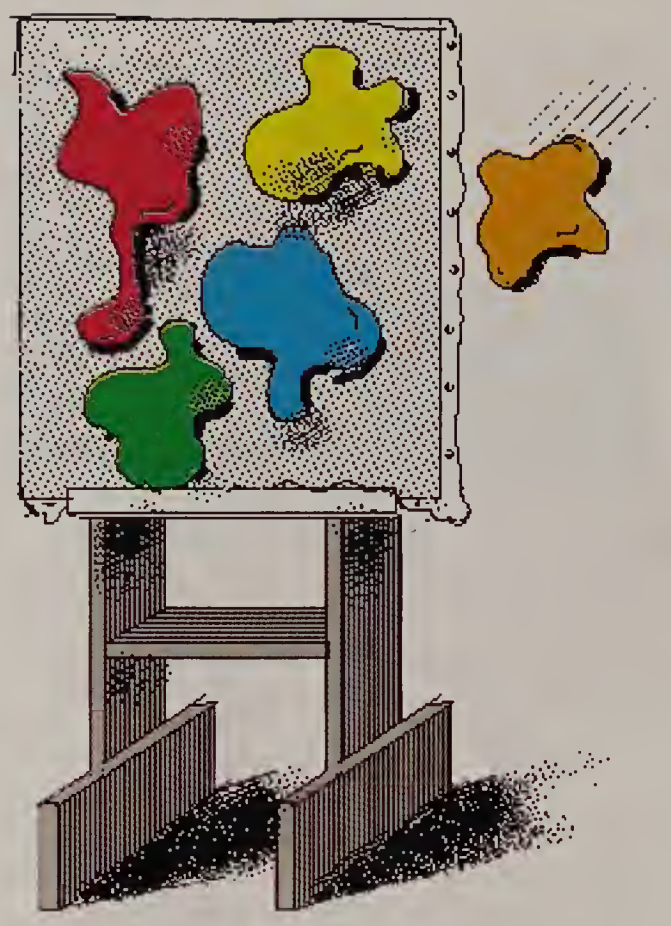
Normally in drawing programs, objects obscure other objects behind them. *Canvas* gives you some control over this for each object by letting you set different transfer modes, which have different effects on overlapped objects. Say you have created a circle and a square on screen, and you've positioned the circle so part of it overlaps the square. If you specify the Copy transfer mode, the portion of the square covered by the circle will remain out of view. If, however, you specify the Or transfer mode, the undercover portion of the square will show through, as if part of the circle were transparent. The Or transfer mode achieves this effect by showing a pixel as black if it's black on the top object *or* black on the object underneath. Unfortunately, Apple's LaserWriter driver doesn't support transfer modes—it prints everything as opaque—so your alternatives are the ImageWriter at one extreme and the Linotronic at the other. And *Canvas*'s documentation never explains what each transfer mode does. Several pages of examples would be helpful.

Canvas even lets you define your own object types and store them as macros (dubbed *MacrObjects* by Deneba) that are added to the Macro menu. Up to 16 macros can be added to the Macro menu at one time, and they can be swapped in and out at will.

MacrObjects behave much like tools on the Tool Palette. If, for example, you commonly use triangles in your drawings, you can define a triangle as a macro object. Choosing your triangle on the Macro menu and dragging draws a triangle. Alternately, choosing your triangle and clicking draws a triangle exactly like the one from which the macro was created.

Squeezing Paint

Amazingly, Deneba has been able to cram 80 percent of the functionality of the *Canvas* application into a desk accessory version called *Canvas DA,* which comes with *Canvas* or is available separately for



$99. Deneba claims that this DA is more powerful than most stand-alone graphics programs, and I have to agree. No longer do desktop publishers have to exit their page-layout program to make a last-minute revision to a graphic.

Canvas doesn't have all the PostScript support of, say, *Cricket Draw,* but Deneba plans to add more in future versions. They also intend to provide libraries of MacrObjects, plus direct control of most popular scanners. All things considered, *Canvas* is more than just another Macintosh graphics program.—*Laurence Kirsh*

See *Where to Buy* for product details.

Come On, Let's Go

Go for the Macintosh

Board game simulation. ***Pros:*** *Decent level of play; great flexibility in setup and display; superior introduction for beginners.* ***Cons:*** *Playing is addictive.* ***List price:*** *$39.95.* ***Requires:*** *512K, 800K disk space.* ***Copy protection:*** *None.*

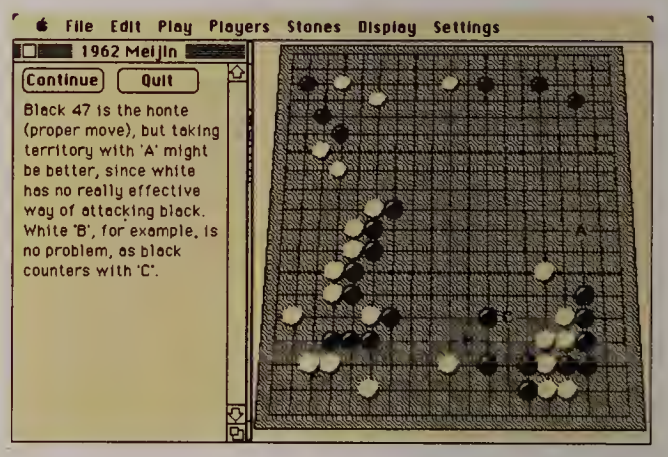


Go, the 4000-year-old national game of Japan, is an extremely refined and aesthetically pleasing pastime. The rules are simple—anyone can learn to play at a recreational level in ten minutes—but devising good strategy is far subtler than in master-level chess. Go inspires a different view of conflict, since playing develops a complex pattern, rather than an increasingly empty board.

The Tao of Go

It's a triumph that computer Go even exists—as late as the middle 1970s anything but beginner's play by a computer was thought to be impossible. Unlike in chess, the Go board fills up, forcing the computer to study the details of increasingly large and complex patterns. Even hundredfold speed increases in conventional computer architecture won't let machines play Go at a strategic, master level. Because of this complexity, the First International Computer Go Tournament wasn't held until 1986, nearly 20 years after the appearance of the first competent computer chess games. *Go for the Macintosh* from Infinity Software placed first for microcomputer entrants in the tournament and fifth overall.

Go is an excellent match for Mac graphics, which give the computer game a nicely realistic look, as opponents alternately place black and white stones on a square grid (see "Masters at Play"). The aim of the game is to capture territory by enclosing it within a line of stones. Although stones can be captured and removed from the board during small battles,

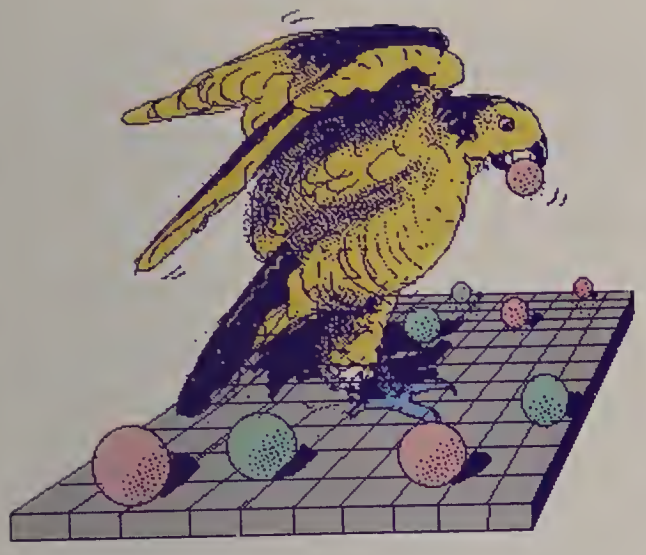


Masters at Play
Go lets players choose a 3-D view of the board and rotate it to "study the angles." This figure shows the middle stage of a classic game between two of the best Japanese players, annotated at left by the program.

the result of a Go game is typically a complicated, beautiful arrangement of stones on a nearly filled board.

Picking Up the Moves

Go for the Macintosh provides an excellent way to learn the game and proves a talented and forgiving opponent. The pro-



gram includes a tutorial managed by the hypertext program *Mini-Guide,* which lets you step through examples and beginner's practice games interactively. The tutorial is based on the American Go Association's standout text *The Way to Go,* which is the clearest exposition on the game yet produced.

Go can also annotate the computer's moves during a game. The program lets you take moves back and give yourself handicap stones. The board adjusts from the standard 19-by-19-line grid to a smaller 9-by-9 or 13-by-13 grid for faster games (a 9-by-9 game takes about eight minutes). This feature helps you practice tactics on a small scale.

Higher Levels

If you already play Go, you will find *Go for the Macintosh* more patient and probably more capable than most of your human opponents. Although no program is likely to play *dan-level* Go (the highest master level in Japan) anytime soon, this program can take on good players at a university Go club. You also can change the computer settings for the number of moves played ahead, making play more difficult; you can change the relative weights for stone capture versus territorial moves; and you can set 20 or so parameters that direct strategy and tactics. In effect, you can improve your game by putting more pressure on your particular weaknesses.

Go lacks long-range strategic sense, but the program is adept enough in small battles to keep you quite busy. Also, on the 9-by-9 and 13-by-13 grids, where the number of possible moves is much smaller, the program can seriously challenge strong players. And of course, if you are one of the few Americans with 5-dan amateur status, you can always give the program a few handicap stones to make things more exciting.

This program is a masterpiece and one of the best recreational software bargains around.—*Charles Seiter*

See *Where to Buy* for product details.

A Tutor for Freshman Physics

Physics

Introductory science tutorial. ***Pros:*** *Brilliantly animated illustrations of many basic principles of physics; interactive quiz mode; coordinated with standard text material.* ***Cons:*** *Weak spots in material; a few problems with Problem mode.* ***List price:*** *$99.95.* ***Requires:*** *512K.* ***Copy protection:*** *Key disk.*

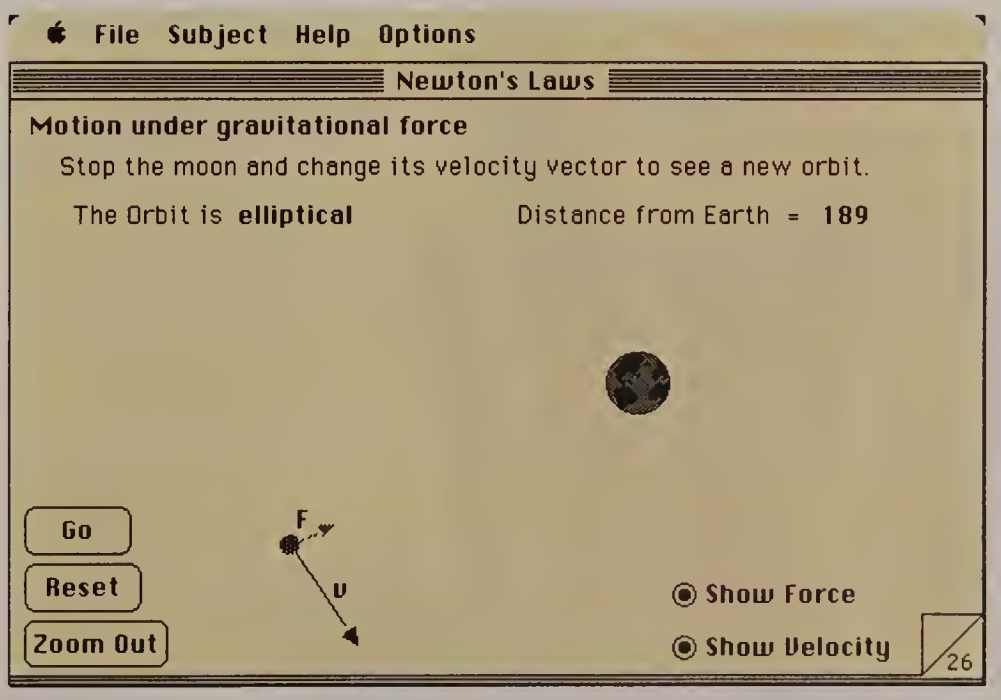


Physics is a subject that presents unique teaching difficulties. Progress depends on insight in applying mathematics, which students often have a somewhat shaky background in. So there are two challenges: a given physical situation must be presented in a meaningful way, and the related math must be made simple and clear. The first challenge usually calls for pictures, the second for ingenuity. *Physics,* from Sensei Software, shows plenty of both. It is the most effective physics tutorial available, with the possible exception of some experimental systems elaborated by physics departments at large universities. *Physics'* developers have successfully attacked formidable pedagogical problems and created a product that is both entertaining enough to appeal to the intellectually curious and a boon for science students at all levels.

Around the World in 80 Seconds

Physics follows this format: an animation of a diagram from a standard physics text is followed by a selection of interactive problems for drill in the basics of physics calculations. Despite the innovative features of the program, it is well connected to standard teaching practice, and it's easy to match up textbook problems with those in the software. Although you might want to work through *Physics* chapter by chapter, the program's index moves you immediately into any of the several hundred topics available.

"In Orbit" shows a typical animation: the force and velocity vectors for a moon in orbit. You can change orbit starting conditions (the direction and magnitude of the velocity vector) and even send the hapless satellite hurtling off into deep space, if you like. Diagrams frequently have italicized "hypertext" terms which, when clicked on, show a highlighted part of the diagram. In many examples, a button for calling up a calculus-based description of the diagrammed situation is also provided. The animation is then usually followed by several sample problems, which can be solved



In Orbit
The animated textbook illustrations in Physics *can be easily matched with static examples from a textbook, but they convey an amazing amount of information simply by moving. This example imparts a feeling for the delicate balance of forces required for a stable orbit.*

using a pop-up scientific calculator. Problem solving is facilitated by several options; the program may refer you to sections of text for help, and it features a Hint button in many difficult cases.

Problems 2.1 and 2.2

The first five chapters of the program are the best introduction to mechanics you are likely to find. Since this material represents the first third of a one-year physics course, it's crucial. *Physics* is just the thing for building students' confidence and clarifying basic concepts. The chapters on electricity and magnetism are also very good.

It's not clear whether the developers ran out of energy or just disk space, but the material on thermodynamics and on waves is weak. Perhaps the market doesn't justify expanding this program into *Physics I* and *Physics II,* but it would be valuable from a teaching viewpoint to enhance these sections and add a few more.

The Problem mode also has a modest design shortcoming. Despite admirable effort in the text to impart the idea of significant figures in a calculation, the program simply signals *Incorrect* if you enter a typical unrounded calculator answer in a problem. This may confuse students, especially when they have set up the solution correctly, and there should be a separate flag to specify *Incorrect—too many digits in answer.*

These are mild caveats about a program that does an excellent job overall. This approach could be extended to any part of the science and engineering curriculum. Sensei has developed a similar program for geometry and is preparing one for calculus. It would be good news for education if Sensei extended the format through differential equations and beyond.
—Charles Seiter

See *Where to Buy* for product details.



It Won't Necessarily Get the Job

ResuméWriter (Personal Version) *1.0*

Résumé-writing aid. ***Pros:*** *Automatic reformatting; ease of use.* ***Cons:*** *Lack of format flexibility; limitations on entry size; can't see whole document while writing.* ***List price:*** *Personal Version $100, Student Version $30.00.*
Requires: *512K.* ***Copy protection:*** *Initialized to user.*

I've been writing résumés professionally for many years and doing it on the Mac since 1984. With as many as ten résumés a week flowing through my office, I'm always interested in anything that makes my life easier.

ResuméWriter, from Bootware Software, lets you switch among three formats (actually four formats, but two are very similar) and does all the layout chores itself. And it's a good tool to help clarify one's history and goals—particularly for someone with a fairly traditional work history. A résumé generated with this package will help get you started, but *ResuméWriter* won't save a résumé weakened by passive language, lack of focus, or wordiness.

Preparing Your Résumé

As with many database programs, information is entered on a series of screens. To enter a job, for example, you fill in the company name, address, and phone number. The next screen allows a few lines to describe the company. And the screen after that prompts you for your job title, job description, and starting and ending dates.

Each screen is fully editable, and when you're preparing different versions of a résumé you can choose whether to include or exclude a screen. However, you can't exceed the space the program allows for each entry (for a job description, it's only about 3½ lines in 12-point Chicago). And because the text-entry box cannot be filled completely, you think there's still a line and a half to go when it runs out of room.

For creating a custom version of your résumé, you may include or ignore any screen, but you can't choose between fields in the same entry screen. You can, however, define your own category headings, which is a nice feature.

All content editing is done at the screen level. When viewing the whole résumé, you can change formats, select fonts, and add visual garnishes, but you can't change any of the information you've entered. This means that as you edit, you can neither see the complete entry for a job, nor the total product. But it's easy enough to go back to any of the data-entry screens and change details.

The Program's Assumptions

ResuméWriter makes some questionable assumptions about how résumés should be written. It asks for irrelevant information, such as the complete address of all employers, and allows as much room for a company description as a job description. While you can work around these limitations, it would be easy for the inexperienced to bury crucial information under trivia.

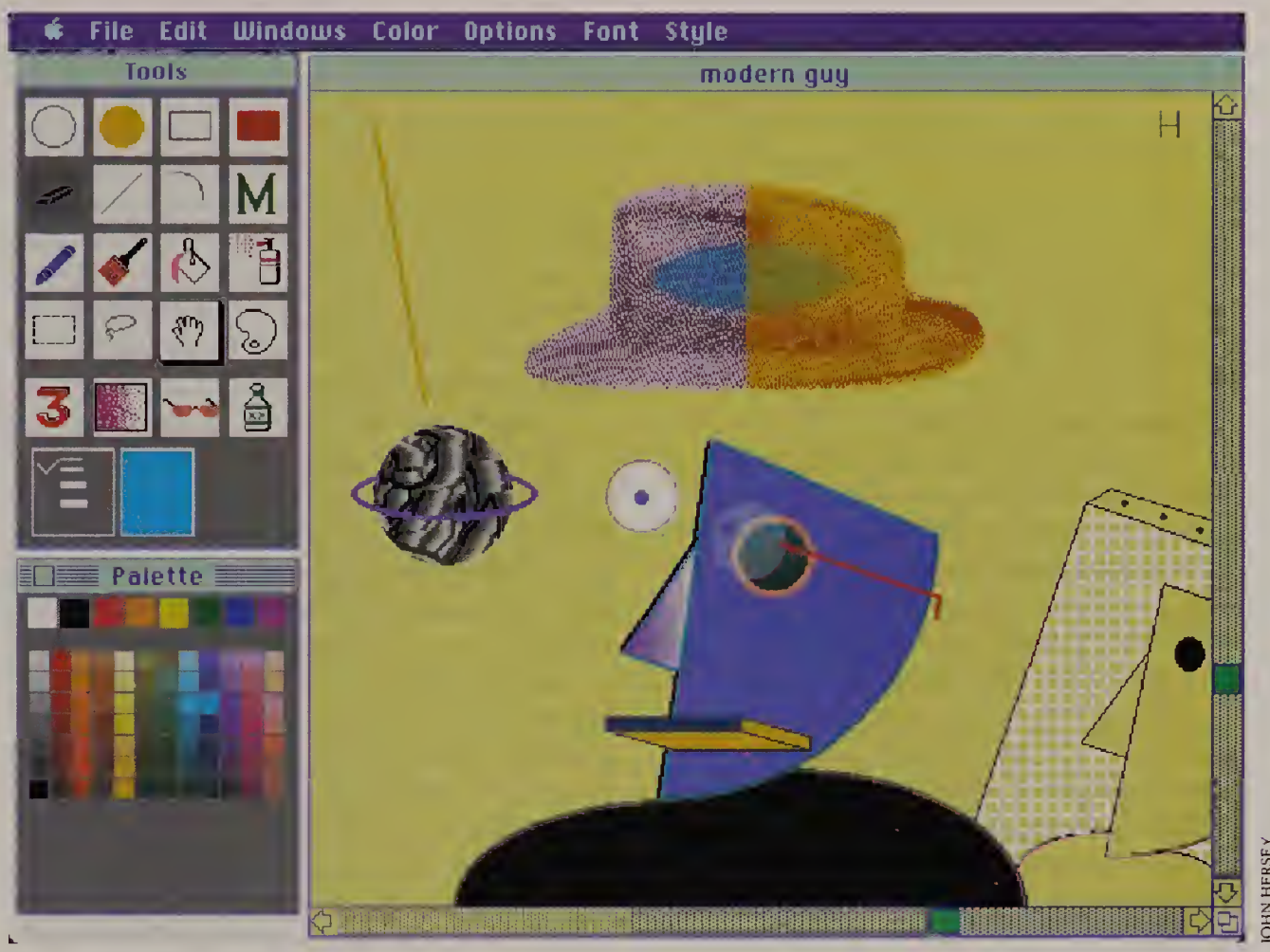
The program provides three basic formats: two columns; one column with left-justified section heads and indented text; and one column with centered heads or a combination of centered and left-justified section heads. It does not support the popular bulleted format; all entries must be in paragraph form. And it limits you to nine job entries and three education entries.

ResuméWriter's formats work well enough for those with typical work histories. But for others it's not flexible enough. I use over a dozen résumé formats, depending on what makes the client look best.

Perhaps *ResuméWriter*'s problem is its perceived niche in the market. While it's not a good choice for the novice writer working on a personal résumé, it would clearly work in classrooms, and as one of several tools for professional résumé writers.

Bootware plans to add the capabilities to edit paragraphs in the Display Resume mode (thus allowing bullets), to create multipage curriculum vitae, and to export files to popular word processors. So the program may yet grow from a useful clarification tool into a serious résumé writer.
–Shel Horowitz

See *Where to Buy* for product details.



The Modern Guy
Several of Modern Artist*'s features appear in this picture created with the program. The hat is a scanned image imported and colorized. The planet is a gray-scale image also imported, and the mouth is a 3-D box from the rectangle tool.*

Chromatic Options

SuperChroma

Add-on hardware and software color system. ***Pros:*** *Easy-to-master* MacPaint*-like interface; video freeze-frame option for capturing TV images.* ***Cons:*** *Expensive; screen flickers; low resolution; slow at times.* ***List price:*** *SuperChroma with* ChromaPaint *$1500; Enhanced Video Option $1500; Sony Trinitron 12-inch monitor $650.* ***Requires:*** *512K, 800K disk space.* ***Copy protection:*** *None.*

Modern Artist

Color paint program for the Mac II. ***Pros:*** *First color paint program available; easy-to-use interface.* ***Cons:*** *No video freeze-frame option; low resolution.* ***List price:*** *$199.* ***Requires:*** *Mac II.* ***Copy protection:*** *None.*



Long before the arrival of the Mac II, Computer Friends offered color on the Mac. With the SuperChroma system, comprising a display graphics controller, a color monitor, and *ChromaPaint* software, you can paint in color on a Mac 512K, a Plus, or an SE. Color illustrations can be created with *ChromaPaint*'s *MacPaint*-like drawing tools, and images from *MacPaint* and other graphics programs can be imported to *ChromaPaint* and colorized.

The basic SuperChroma system–graphics controller, monitor, and *ChromaPaint*–sells for $2000. It requires no modifications to your Mac, and it's connected by a cable to the modem port.

With the Mac II now available, SuperChroma may seem an expensive way to add color, especially when you consider that it runs only *ChromaPaint*–no other Mac programs, color or otherwise, can appear on the color monitor. It also uses both screens at once: the Mac screen displays the menu bar while the SuperChroma monitor works as the paint canvas (which is four times the size of a *MacPaint* canvas). But SuperChroma offers two advantages: it adds color capabilities to Macs not designed for color; and it provides a link to NTSC video, the U.S. standard for television signals.

For an additional $1500, Computer Friends' Enhanced Video Option (EVO) provides an interface to a television set, a VCR, or a video camera. With this setup, you can overlay *ChromaPaint* graphics or titles on a video image and then return the image to its video source. A freeze-frame option lets you capture an image from a video source and work with it as a *Chroma-Paint* image.

Painting in Color

For the Mac II, Computer Friends also offers *Modern Artist,* the equivalent of *ChromaPaint,* for $149. However, *Modern Artist* requires 2MB of RAM. (Since the two programs are virtually the same, references to *ChromaPaint* in the following description apply to *Modern Artist* as well.)

ChromaPaint offers distinct improvements over *MacPaint,* such as a bigger drawing area and a wider array of tools. It also has an improved spray can and an arc tool. For the most part, however, *ChromaPaint*'s tools mimic those of *MacPaint.* The feature that really sets *ChromaPaint* apart is, of course, color. You can use as many as 96 colors simultaneously from a palette of 256, and you can adjust colors for hue, tint, saturation, or intensity in either the palette or the drawing area.

ChromaPaint's other notable advantage over *MacPaint* is the addition of 3-D effects. Although primitive when compared to those of 3-D CAD programs, such as *Mac3D* or *Pro3D,* they provide a way to automatically add three-dimensional shading to objects in an illustration. You use the 3-D tool in conjunction with the filled rectangle tool to create cubes, or with the filled circle to produce shaded spheres. The tool not only shades objects but allows you to choose a light source before rendering them. Other interesting shading effects are possible; for example, using the 3-D tool with the selection rectangle produces a rectangle with a continuous shading between two colors.

ChromaPaint has an annoying screen flicker caused by a problem with the NTSC signal. You can work around it to a degree, but not entirely. Both programs are extremely slow at times; more than once I thought they had frozen. But on the whole, *ChromaPaint* seemed bug-free, and the minor problems I experienced with *Modern Artist* probably occurred because I was working with a prerelease version.

Balancing the Options

After using the two programs in the same work sessions, I found *ChromaPaint* slightly superior. It offers the video freeze-frame option, a larger canvas, more tools, and more 3-D effects than *Modern Artist.* These are minor differences, however, and *Modern Artist* has a few pluses of its own, including superior FatBits, color control, Rotate and Flip commands, Undo capabilities, and better documentation.

To enable you to print what you see on the screen, Computer Friends offers the Shinko CHC-335 color thermal printer at $4590 for the standard model and $7800 for a model that handles up to 11- by 14-inch pages. At 200-dots-per-inch resolution, this printer's output is closer to that of a LaserWriter than an ImageWriter, but it still is not printshop quality. The company also has a PostScript program that allows you to produce color separations directly from the screen. *Color Sep* ($99) makes a PostScript screen dump and automatically produces a four-part separation. And Computer Friends' $599 genlock card, TV Producer, makes the Mac II's video card compatible with NTSC signals, so you can overlay live video with graphics and titles.

The SuperChroma system offers NTSC compatibility, but it is an expensive way to add color capability to the Mac. *Modern Artist,* on the other hand, is a good product at a reasonable price.—*Scott Beamer*

See *Where to Buy* for product details.



This Base Is Loaded

***1stDesk** 3.5*

Relational database system. ***Pros:*** *Good report generation and mail-merge capabilities; built-in telecommunications software; can scan a* MacPaint *form to create a data file design.* ***Cons:*** *Documentation poorly organized and hard to use.* ***List price:*** *Four-module system $195; multiuser version 4.0 $295; demo version (10 records) free.* ***Requires:*** *128K.* ***Copy protection:*** *None.*



1stDesk is a relational database system that does more than just keep track of data. An enhanced version of *1stBase,* one of the first databases for the Macintosh, *1stDesk* consists of four program modules: 1stFile, 1stScan, 1stMerge, and 1stPort. The program handles large records and files and has an array of powerful, advanced features, such as the ability to convert data between file formats; to generate sophisticated, attractive reports; and to merge print forms, labels, and envelopes.

Four of a Kind

Although it's in the same class as *Omnis, Helix,* and *Reflex,* easy-to-use file design sets 1stFile apart (see "Blueprinting"). Data entry is also simple; you just choose Add Records from the Forms menu to display a blank data entry form. 1stFile's relational capability lets you combine several files into one (the files must share one field that has the same type and length). Reports are easy to design and can include macros for calculating new information. Printed reports are restricted to one font, but can be exported to *MacWrite* for more elaborate formatting.

1stScan uses a simple method to create a database blueprint and a custom data-

entry screen: it scans a *MacPaint* image of a form (either drawn or scanned with a digitizer) and creates a blueprint for the data file based on underlined spaces and blanks. In 90 seconds an exact duplicate of the form appears on the screen, ready to use for database entry. The program lets you scan different fonts, type styles, and even graphics. Adding information to a new data file is as simple as filling in a form, so virtually no training is needed to get started.

1stMerge is a powerful, flexible mail-merge utility designed to work with 1stFile data files and *MacWrite* (and other word processors that accept *MacWrite*-format files, such as *Microsoft Word* 3.0). Unlike other print-merge programs, 1stMerge does not require you to save data in a special format. You simply set up a form letter in *MacWrite,* enclosing field names in brackets, then return to 1stMerge to print. The Scan/Don't Merge feature lets you preview your form letter before printing to make sure field names and brackets are entered correctly. Sample *MacWrite* documents are included for printing envelopes and mailing labels, up to five across a page –a feature most other mail-management programs don't provide.

1stPort is a data-transport and file-conversion utility that allows you to change text and data files from 1stFile, DIF, SYLK, and flat-file formats to any other format. You don't have to convert a file initially to 1stFile format; 1stPort can, for example, convert a *Multiplan* file to *1-2-3.* The program supports telecommunications for modem and hard-wire links (up to 9600 baud). It also includes a text editor, so you can remove control characters and other garbage from files that have been received and adjust column boundaries to display data more attractively.

The Minus Side

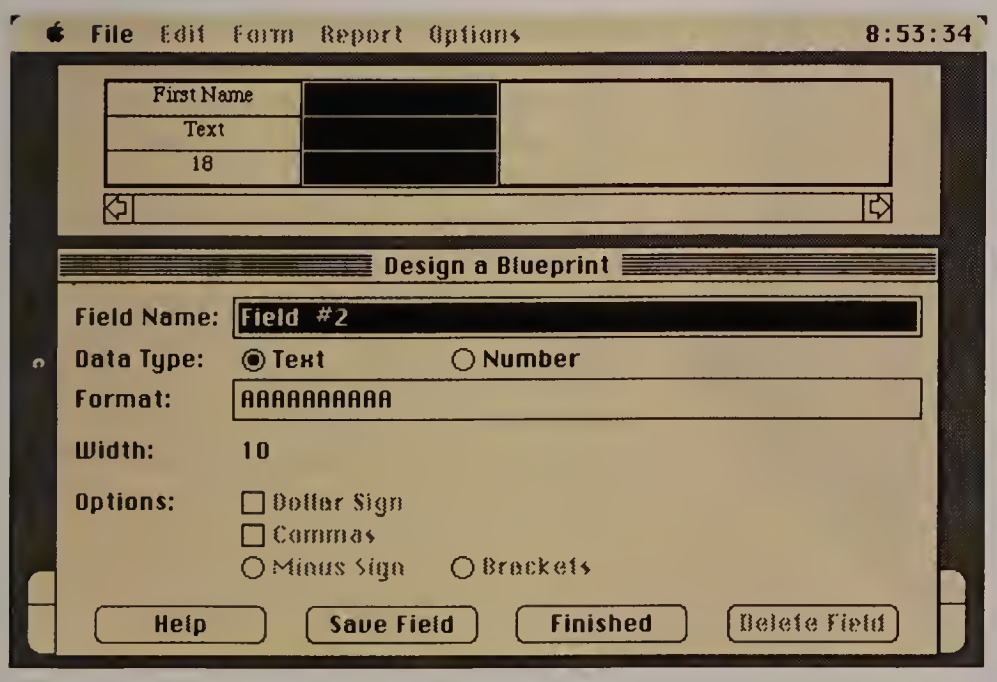
1stDesk has some shortcomings. It deviates from the Mac interface in small ways. For example, to save a report design you select Save from the Report menu rather than from the File menu. Another minor inconvenience is that data file searches start at the displayed record, not at the beginning of the file, so before initiating a search, you must return to the first record.

1stDesk has been upgraded several times. Reports designed using earlier versions of the program are incompatible with later versions. To upgrade a report, you must re-create the design by either copying the old instructions manually or capturing them via screen dumps one screen at a time–an inconvenient procedure.

Context-sensitive help is available online, but often you must refer to the lengthy, poorly composed manual. Though the manual's tutorial sections are well written and illustrated, references are difficult to find. Many pages are not numbered, there is no table of contents, and the indexes are buried in the body of the manual.

Althought the manual is disappointing, the program is excellent. Overall, *1stDesk* is a capable database manager with simple file design, powerful mail management, and sophisticated file-conversion capabilities. Be sure to look at the free demonstration disk before you buy this database manager.–*Nanci Hamilton*

See *Where to Buy* for product details.



Blueprinting

Before you can enter data, you define the fields that make up each record. 1st Desk's *1stFile module recognizes two types of fields: text and numeric. Field length is set by clicking within the Format box and typing characters. To modify an existing Blueprint, open the data file you wish to alter and select Change Blueprint from the File menu.*

A Concert in PostScript

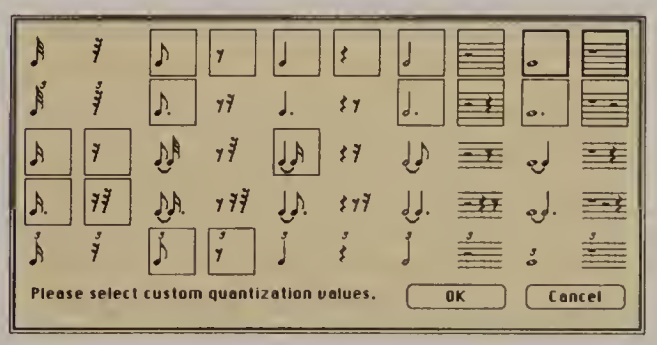
Concertware+MIDI *4.00*

Music notation program. ***Pros:*** *Ease of use; fast conversion of MIDI input to notation; formatting flexibility; compatibility with Sonata (PostScript music font); lyrics automatically adjust spacing on reformatting.* ***Cons:*** *Some symbols missing or overly difficult to enter; only eight staves per system; no part-extraction capability; no way to tighten up spacing; difficult to override automatic transcription.* ***List price:*** *$149.95; $25 upgrade from* Concertware+ MIDI; *$70 upgrade from* Concertware+. ***Requires:*** *512K.* ***Copy protection:*** *None.*

Great Wave software's latest version of *Concertware+*MIDI is the first commercial program to let you print music played in real time (as opposed to step time or note-by-note) with Adobe Systems' revolutionary PostScript music font, Sonata. As in the earlier versions, the package consists of three applications and a collection of sample files, MIDI setups (for popular synthesizers), and instruments (for the Mac's speaker).

Inventory

Great Wave changed the Instrument Maker and MIDI Player portions of the program by grouping all instruments into a single library accessible by the three applications. The MIDI Player now has additional features: a volume control, displayed tempo changes ranging from 30 to 225 beats per minute, MIDI setup data, and synchronization to an external device via MIDI Sync. An interesting innovation is the ability to synchronize Macintosh-synthesized music to the external MIDI device as well.



Quantization

Concertware+MIDI *4.00 implements a new form of quantization upon input. Users specify an arbitrary set of note durations and rest values to which all MIDI input will be "rounded off."*

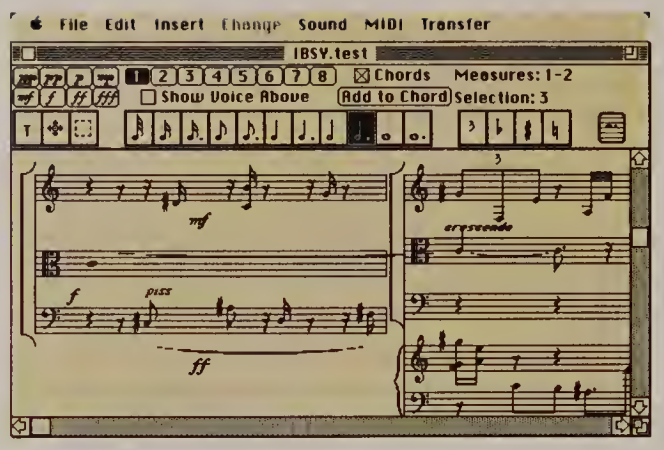
Most of *Concertware+*MIDI's new features are implemented in the Music Writer application. Music played on any MIDI keyboard in real or step time may be auditioned, rerecorded, or inserted directly into a score. Cut, Paste, Copy, Search, and other functions are easy to execute. For inputting from a MIDI keyboard, the new version adds the option of placing the symbol palette at the top of the screen. If you don't have a MIDI keyboard, you can input notes with the mouse or play them in real time on the Mac keyboard.

The speed with which *Concertware+*MIDI 4.00 converts MIDI data into conventional music notation is unparalleled, due in part to the software's ability to quantize upon input. In most MIDI sequencers, quantization is applied after a performance has been recorded. *Concertware+*MIDI 4.00 lets you preselect a set of rhythmic values; the program then rounds off all MIDI-supplied rhythmic data to match the nearest preset note values (see "Quantization").

Whereas earlier versions of *Concertware+* allowed only eight monophonic (single-note) melodies to appear on two staves, version 4.00 permits eight polyphonic (multiple-note) melodies, each with up to eight simultaneous notes, to be notated on up to eight staves. After entry, you can isolate any grouping of notes from chords, making quick work of delineating the melody or bass line. Furthermore, the developers have solved a problem that has plagued sequencer/notation packages from the beginning: individual parts may now jump from staff to staff at any point.

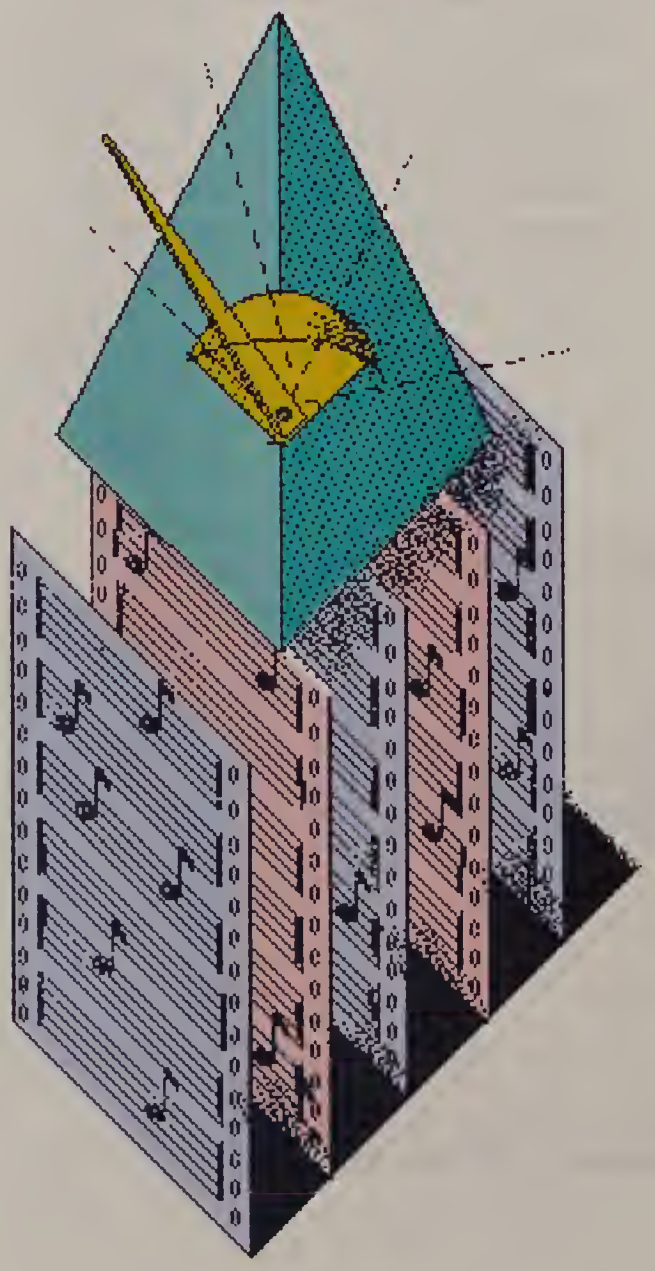
*Concertware+*MIDI's formatting options allow you to insert a ruler at any point (see "Formatting"). These rulers give you complete control over the spacing between staves and systems; over page, measure, and line breaks; and over brackets, braces, and clefs. These rulers also give you access to a number of powerful musical parameters. They allow you to determine the number of staves that are displayed and/or printed, to assign parts to particular staves, and to place dynamic (loudness) markings in the score.

Of course the best news is that *Concertware+*MIDI prints with Adobe's PostScript music font, Sonata. Because this font is not a bit-mapped character set, the output from a LaserWriter or other PostScript printer is much closer to publication quality than before, and ImageWriter printing is also vastly improved. (However, Sonata doesn't allow slanted beaming.) Although Great Wave supplies the screen fonts needed for Sonata, to download the actual font to your LaserWriter you must purchase the $95 downloadable version from Adobe—otherwise the printer merely creates a bit-mapped version of the screen fonts.



Formatting

Rulers analogous to those used in MacWrite *give you complete control over spacing between various elements and over the assignment of parts to a particular staff.*



Elegant Additions

For the more sophisticated user, version 4.00 offers MIDI Synchronization options that either "slave" the program to an external device (such as a sequencer or drum machine) or vice versa. While it has no SMPTE (Society of Motion Picture and Television Engineers) timecode lockup features, *Concertware+*MIDI's sync capabilities are fully functional and provide a great introduction to synchronization.

*Concertware+*MIDI handles text similarly to Mark of the Unicorn's *Professional Composer:* by using the Tab key instead of the spacebar, you can permanently attach words and syllables to specific notes. In this way lyrics automatically accompany the appropriate notes, despite changes to the score.

Educators or authors who want to combine musical examples with text can use the selection box to copy any portion of the screen and transfer it to a word processor. *Concertware+* files may also be saved as *MacPaint* documents for further polishing.

For the money, *Concertware+*MIDI 4.00 is the easiest way to output printed music to a PostScript printer. In spite of its superior printing capabilities, the program does have a few significant drawbacks. The eight-stave limitation may pose some problems, particularly for orchestral composers. Others will be dismayed to hear that the part-extraction capabilities found in earlier versions of the program, rudimentary as they were, have been removed. Some basic symbols such as crescendo and diminuendo are missing. Although you can add such performance instructions through the text option, you must invoke the program's esoteric MIDI Macro options to make MIDI instruments respond to these expressive markings. Because key signatures are global, you will have to take extra steps when you use a synthesizer to preview a score that is to be played on transposing instruments.

While not as robust in features as some of the more expensive professional music notation packages, *Concertware+*MIDI version 4.00 should be the choice for first-time MIDI musicians and anyone who needs quick-printed PostScript output from music played in real

time. Deeper in the program are powerful tools that can satisfy intermediate to advanced users as well.
–Christopher Yavelow

See *Where to Buy* for product details.

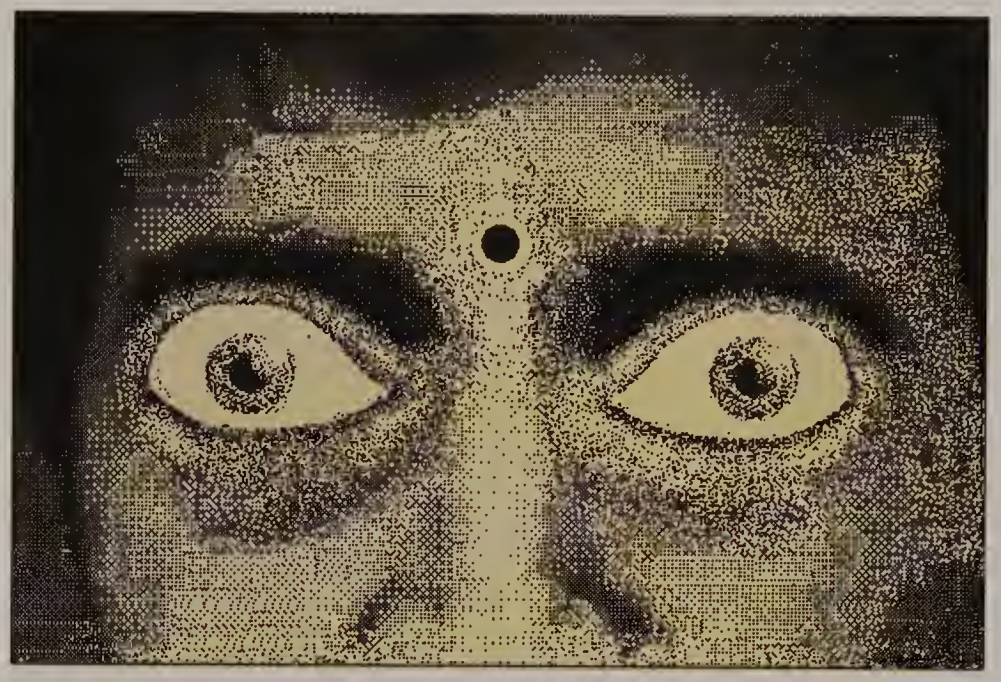
Piece of Mind

***Subli-Mac** 2.0*

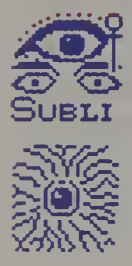
Self-help program. ***Pros:*** *Easy to use; encourages relaxation and positive thinking.* ***Cons:*** *Hard-to-read manual lacks useful examples and makes many unsubstantiated claims; animation and subliminal displays are erratic.* ***List price:*** *$39.95.* ***Requires:*** *512K.* ***Copy protection:*** *None.*

***Mac-ESP** 1.4*

Self-help program. ***Pros:*** *Easy to use; encourages relaxation and concentration.* ***Cons:*** *Hard-to-read manual makes many unsubstantiated claims; lack of random selection makes objective testing difficult.* ***List price:*** *$49.95.* ***Requires:*** *512K.* ***Copy protection:*** *None.*



The Hypnotist
One of many sets of Subli-Mac *eyes watches you while your subliminal messages flash on the screen.*



Remember the scandal when moviegoers of the fifties discovered that many films contained messages (You want popcorn) that flashed on the screen so fast they were invisible to the conscious mind? Remember the talk about how those messages went straight to your subconscious (Buy popcorn!), influencing your behavior without your knowledge? Well, they're back.

A new program from Psy-Den America Corporation, called *Subli-Mac,* promises to harness the power of subliminal messages to help you change your habits, develop new skills, and generally become the person you've always wanted to be. This time around, you can write the messages that you view subliminally. Once they're composed, you can save them and reprogram yourself as often as you like.

According to the manual, subliminal programming works best if you achieve a relaxed alpha state. To help you get there, *Subli-Mac* displays a series of colors on your screen that leads you from active red to calm indigo. The million Mac owners who don't have color monitors are advised to use colored cards or visualize colored images, by thinking, for example, "I am totally surrounded by red. I see tomatoes."

Once you're *alpha*-betized, you meditate on a hypnotic pair of eyes, set in a partial face bearing a flashing "third eye" on its forehead (see "The Hypnotist"). You choose among several sets of eyes or geometric patterns. Whatever you focus on, you become aware of your messages briefly flashing at regular intervals. Just ignore them; they're talking to your subconscious, not to you.

The Ridiculous to the Subliminal

Can regular sessions with this program over an extended period of time really change your behavior? Maybe. Could you achieve the same results by regularly meditating on a handwritten or memorized affirmation? Probably. It would take an expensive, carefully controlled study to determine whether there's any advantage to subliminally programming yourself with *Subli-Mac.*

If you're more inclined to put your research dollars into extrasensory perception, you can try *Mac-ESP,* also from Psy-Den. You have to go into an alpha state first, using the same colorful techniques as you would with *Subli-Mac.* Once you're there, you bring up a screen with cards containing either the geometric shapes of the classic Zenner cards or descriptions of images of people and places. Choose one, click on it, and concentrate on the full-size image that appears on the screen. Then try to send a mental picture to someone across the room (or across town). Every few seconds the image on the screen inverts briefly to remind you to concentrate; otherwise, it behaves like an ordinary playing card.

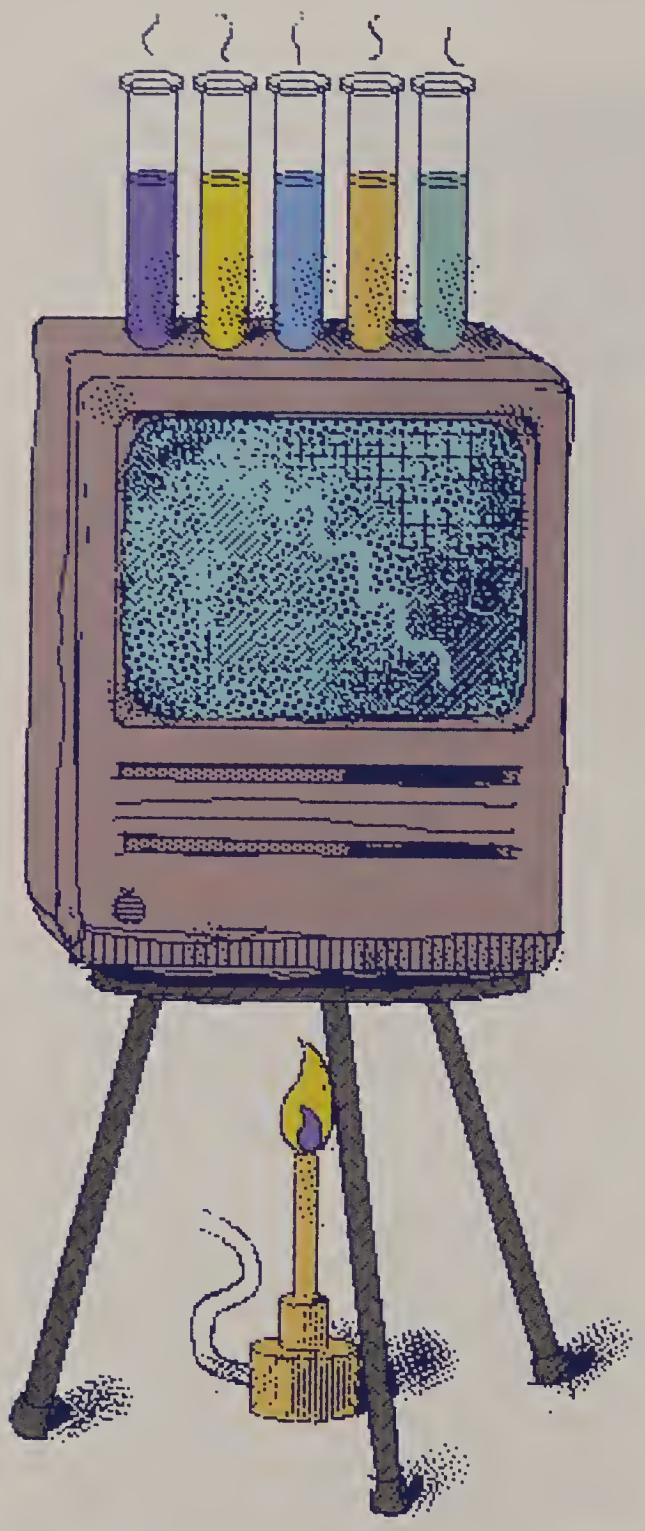
For scientific ESP study, a physical deck of cards might be better; it would allow for *random* selection of images, eliminating the possibility of the receiver second-guessing the sender's preferences. (The developer claims that random selection was intentionally left out because telepathy works better if the sender has freedom of choice; skeptics say intuition is not telepathy.)

Read My Mind

In case you haven't sensed it by now, I have a problem with these packages: hype. The company's ads, manuals, and online documentation are full of outrageous claims about how these programs can change your life or your business; they're virtually devoid of concrete references for anyone who's interested in seriously studying consciousness. I'd find it a lot easier to like these programs if they were marketed as entertainment packages or if they provided more references and examples to convince skeptics that they really work.

Personal computers have many positive applications in the arena of human potential; for example, they're widely used with biofeedback devices to help control stress. But I'm not convinced that *Subli-Mac* and *Mac-ESP* do anything that can't be done as well without a computer. Unless you're a collector of New Age paraphernalia or high-tech oddities, I recommend you spend your personal-growth budget on books, cassettes, or a workshop, instead of these programs.*–George Beekman*

See *Where to Buy* for product details.



Getting on the Bus

GPIB-SE

IEEE-488 instrument controller/coprocessor board for the SE. ***Pros:*** *Well-engineered controller for popular instrumentation bus; 68881 coprocessor and DMA options available; outstanding technical support.* ***Cons:*** *Inadequate documentation.* ***List price:*** *Controller board $495; DMA option $300; 68881 option $500.* ***Requires:*** *Macintosh SE.*

The single slot in the Macintosh SE and the wide-open architecture of the Mac II have relieved the problems of data acquisition and interfacing to scientific instruments. On older Macs the process required awkwardly kludged clip-on boards or serial-port schemes. While the Mac II is perhaps a more obvious choice for add-on board development (National Instruments has several Mac II cards), the SE's small footprint and lower price make it attractive for actual lab use. Since the SE has only one card slot, however, manufacturers of SE interfaces must provide all likely options–such as math coprocessors–on their boards.

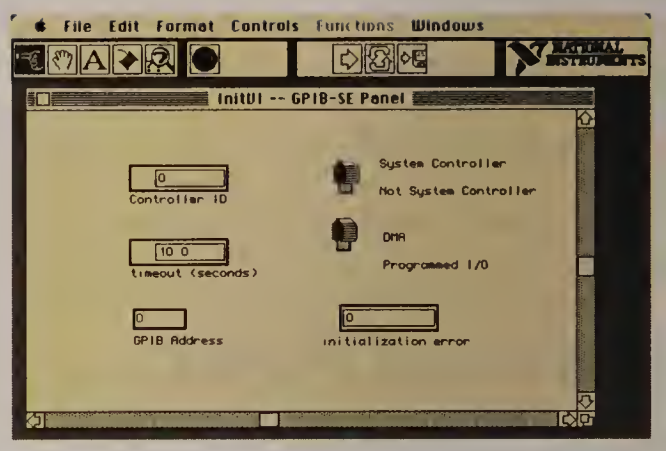
National Instruments has solved that problem with its multifunction SE card, which interfaces with instruments designed for the General Purpose Instruments Bus (GPIB), defined by ANSI/IEEE Standard 488-1978. The GPIB has been widely adopted for scientific instruments, including testing and measurement equipment. The convenient and well-documented interface has a data-transmission rate of up to 1 megabyte per second, making the GPIB-SE worth considering for nearly anyone who uses laboratory instrumentation.

Hooking It Up

Although the GPIB-SE can be installed by anyone with a Torx screwdriver and a modest amount of courage, only installation by an Apple dealer will preserve the SE warranty. National Instruments provides diagnostic software to check on the installation. Installation simply involves sliding the board into place and connecting the GPIB port to the SE's back panel.

A *LightspeedC* language interface is provided with the GPIB-SE, ensuring an economical route to data acquisition. For larger lab budgets, National's *LabVIEW* programming system ($1995) supplies an easy-to-use interface. Using *LabVIEW,* it took three hours to set up data acquisition from a Hewlett-Packard 1090 liquid chromatography system.

LabVIEW provides a prepackaged initialization screen (see "SE How They Run") for the GPIB-SE as a virtual (user-definable, software-based) instrument and offers a special set of program icons for managing communications on the IEEE-488 bus (see "Boxes, Little Boxes"). It also offers "canned" interfaces for a long list of standard laboratory instruments. For instruments on this growing list, all interface details are automatically handled when you select the virtual instrument corresponding to the lab hardware.



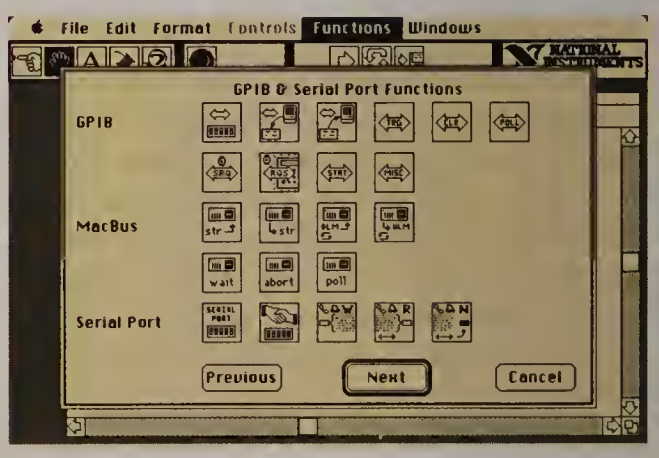
SE How They Run

Under LabVIEW, *the GPIB-SE board has its own start-up screen on disk. The user either calls up a prepared virtual instrument corresponding to the items of lab hardware or writes control strings according to IEEE-488 conventions.*

When the Chips Are Down

The 68881 option is highly recommended for using the SE as more than a simple data logger. For example, a standard Fourier Transform benchmark that requires 76 seconds without the math coprocessor takes 3.6 seconds with the 68881. The 68840 DMA controller, however, is necessary only for the highest-speed data throughput. With a directly programmed interface to appropriate instruments, the board can acquire data at 800 kilobytes per second in practice, pushing the limits of the GPIB bus standards. The DMA option can "snapshot" near-microsecond events, which makes it more useful to physicists or electrical engineers than to chemists or biotechnologists.

The IEEE-488 bus is currently the most useful laboratory data system, and



Boxes, Little Boxes

LabVIEW *also implements icons for the standard GPIB bus control statements. Although* LabVIEW *itself becomes the rate-limiting factor in data transfer at very high speeds, it allows GPIB-SE interfaces to be strung together in hours instead of weeks.*

National Instruments' GPIB-SE board turns the SE into a self-contained lab workstation for use with hundreds of instruments. The board can be programmed through its C interface or with the relatively expensive convenience of *LabVIEW.* The review card tested was well designed (no last-minute wiring patches), and the local distributor reported no problems in the several hundred cards it has sold for PCs and Macs.
–Charles Seiter

See *Where to Buy* for product details.

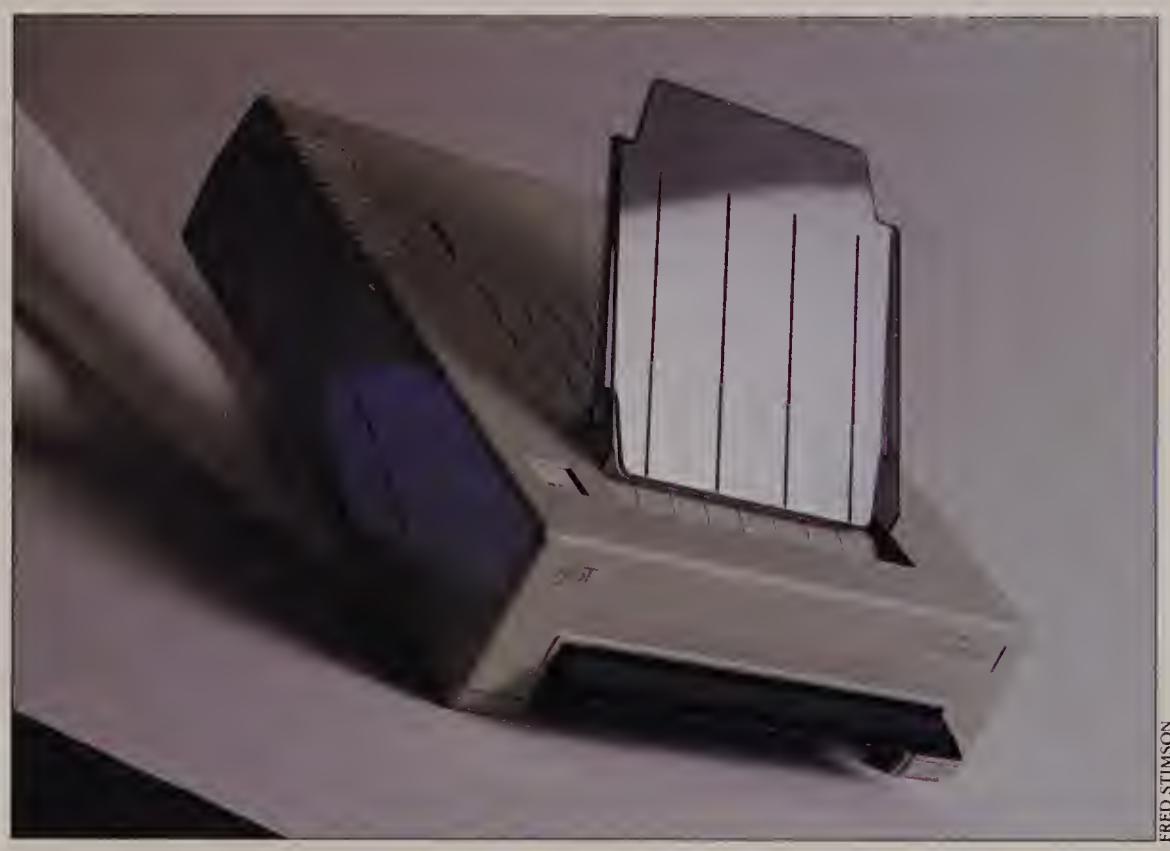
A New Image

AST TurboScan

Image-scanning hardware and software. ***Pros:*** *Gray shades with selectable halftone/line art and halftone patterns; simple setup and scanning procedures.* ***Cons:*** *Inadequate editing software.* ***List price:*** *$1899.* ***Requires:*** *512KE; hard disk for full-page, high-resolution scanning.*



As the ability to detect and represent more shades of gray becomes commonplace in reasonably priced scanners, digitized images are beginning to be smooth and accurate enough for some serious publishing applications. A prominent member of this newer scanner crop, AST's TurboScan, is now available for the Macintosh. With the Microtek scanner engine at its heart and an innovative but unpolished Mac software package for its brain, TurboScan produces high-quality halftone images, although it makes the process somewhat more difficult than it should be.



FRED STIMSON

Getting Acquainted

TurboScan is lightweight (18 pounds) and reasonably compact (15 by 17 by 4½ inches). The only control is a power switch. The back panel is also fitted with two clearly labeled serial and parallel ports. The only differences between the IBM PC and Mac versions are the interface cable and accompanying software. Cabling for both types of Macintosh serial ports (8- and 9-pin) comes with the Mac version.

TurboScan is also easy to set up. Instead of the flatbed design used in scanners like the Hewlett-Packard ScanJet, AST chose a sheet-feeding design; a set of rubber wheels pulls your document through the device. After attaching the serial cable, all you have to do is insert a plastic paper guide into a couple of slots on top of the unit.

Planning Your Scanning

The scanning process is controlled entirely by the SuperScan software. As you'd expect, the program lets you set contrast, brightness, and resolution (from 75 to 300 dots per inch, with many intermediate settings), but it also lets you choose between line-art and halftone modes. You use the line-art mode for text, line drawings, or any image with few and/or contrasting shades; the halftone mode is for images (such as photographs) that have continuously variable shading.

TurboScan's engine is capable of detecting 16 separate shades of gray, which you can display or output in any one of 12 halftone patterns. The mouse lets you define the exact area on the page to be scanned, and you can split that area into separate portions for the line-art and halftone modes. Finding the optimum combination of all these settings can be a laborious process of trial and error, but the defaults usually produce acceptable results even while you're learning.

Feeding the Beast

TurboScan's traction feeding mechanism works smoothly, but unlike a flatbed scanner, it can't scan anything thicker than .012 inch. Nor can you feed in documents larger than 8½ by 14 inches. Using very thin paper also proved difficult; it often wrinkled in the rollers. Fortunately, it's easy to free jammed documents.

Slight but noticeable misalignment is another occasional problem that results in scanned images no longer being square on the page. Finding the correct alignment for irregularly shaped documents is purely a matter of luck.

To compensate for high-resolution scanning's voracious appetite for memory, SuperScan's virtual-memory system swaps out portions of the image to disk as needed during scanning or editing. Even with a hard drive, however, the process is exceedingly slow.

Hidden Dangers

Once an image is safely in memory, you can modify it with SuperScan's built-in graphics editor (a no-frills paint program), but not with scanning settings such as brightness or halftone patterns. Most of the standard *MacPaint* tools are provided, but some features you'd expect to find are missing, especially when it comes to selected blocks. You can't rotate an image

fragment in a block, and there's no way to resize or move the block beyond the area of the image currently visible on screen, except via the Clipboard.

SuperScan has other aggravating rough edges as well. With all but the lightest continuously shaded graphics, when you reduce the screen view of an image, it turns into an illegible sea of black that's worthless for editing. Worse yet, if there's not enough room left on your disk during virtual-memory disk swaps, the program unceremoniously crashes, as it also occasionally does for more mysterious reasons.

SuperScan's file-export facilities are adequate—in addition to its own proprietary format, you can save images in *MacPaint* and TIFF formats, and as standard or gray PostScript text files (for output on high-resolution Linotronics and similar devices).

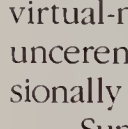
With its gray-scale support and flexible halftone capabilities, scanned images produced with the TurboScan package are at least equal in quality to the output of any other competing scanner. Before you buy, however, be sure you can live with the limitations of the sheet-feeding mechanism and SuperScan's bugs and missing features.
—Steve Cummings

See *Where to Buy* for product details.

QUED Pro Quo

***QUED/M** 2.04*

Text Editor. ***Pros:*** *Powerful, feature-packed text editor with macro facility.* ***Cons:*** *High learning curve for advanced features; manual complete, but dense.* ***List price:*** *$119.* ***Requires:*** *512K.* ***Copy protection:*** *None.*

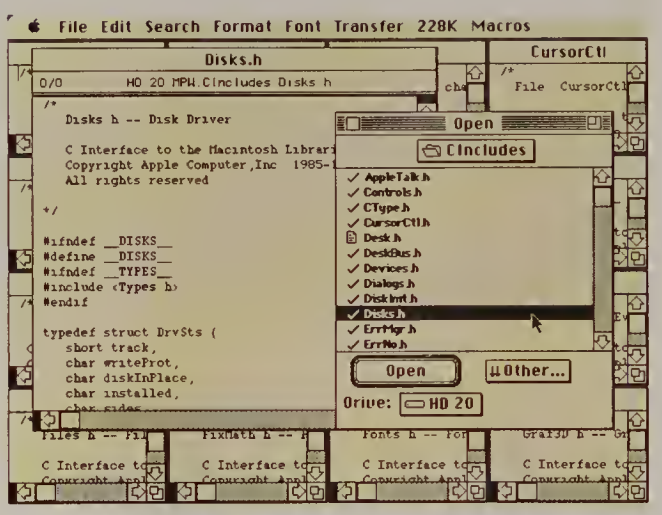


While the Macintosh allows tremendous flexibility in how printed words appear, developers haven't had the same sort of flexibility in manipulating those words before they are printed. Paragon Concepts' first version of *QUED (QUality Editor for Developers)* made it easier for developers to create and edit their source code. Now, two years later, that program has evolved into *QUED/M* 2.04 *(QUality EDitor with Macros),* a powerful tool that should find even wider acceptance.

Mucho Memory

QUED/M is a memory-based editor, which means that it keeps the entire document it's working on in memory all the time. It's capable of working on as many documents at one time as will fit in memory.

The drawback of a memory-based text editor is that document size is limited by available RAM. On a Macintosh Plus with 1 megabyte of memory, though, this means a document size limit of about 300K—not a bad trade-off when you consider the outstanding speed of this memory-based editor. Also, RAM prices are coming down rapidly; soon 2.5MB and 4MB Macs will be commonplace. By automatically taking advantage of available RAM *QUED/M* will handle documents larger than you'll probably ever need, even if you have a 4MB Mac Plus or even an 8MB Mac II.



QUED/M's Window Tiling
QUED/M *allows you to work easily with many documents simultaneously.*

Custom Editing

QUED/M allows you to select and open multiple documents simultaneously through its custom standard-file dialog box. It permits easier document management, too, by letting you either stack or tile the windows on screen (see "QUED/M's Window Tiling"). You can view documents in your choice of font and size, and optionally display line numbers, ASCII codes, and character/word-count information. It also lets you place invisible markers within your text, making it simple to jump instantly to a designated place in your document.

With *QUED/M*'s Find and Change commands you can search your document for text strings and change them. In addition, the program supports regular expressions, so you can search not only for literal text strings but also text patterns with one command. Text searches can take place within a current document, across all open documents, or across selected unopened documents on a disk.

Features Galore

For programmers, *QUED/M* keeps track of matching parentheses throughout a document. It can search through a document and alert you to any unbalanced parentheses, or optionally alert you to unbalanced parentheses as you type. *QUED/M* also lets you define your own "parentheses," allowing it to keep track of matching marks including " ", ' ', [ ], and {}, as well as notations specific to programming languages, like begin/end pairs in Pascal and /* */ comment delimiters in C.

Another unique feature of *QUED/M* is its ability to "fold" text, much like an outline processor does. By simply selecting a range of text and the command Hide Text, you can represent that range of text by its bulleted first line only. As with an outline processor, clicking on the bullet enables you to expand and collapse the text. This feature is useful for compressing longer documents or for showing only headings or function names in source code.

QUED/M has many more features, including synchronized scrolling and the ability to compare two documents. But its macro facility is what truly sets it apart from other commercial text editors. Nearly every command within *QUED/M* is also available as a macro command. When you take into account this editor's regular-expression support, the amount of flexibility you can have in writing macros is truly remarkable. As part of the package, Paragon Concepts includes over 50 sample macros that demonstrate the program's capabilities.

QUED/M's abundance of features lengthens the learning curve for users. Fortunately, the number of features does not get in the way of taking advantage of the program's power. There are a few diversions from the standard Mac user interface (like the custom standard-file dialog box), but many of these contribute to the program's extended functionality. *QUED/M*'s manual is quite complete, but the descriptions of features are packed into it almost as tightly as the features are packed into

the program. A longer tutorial section would be helpful.

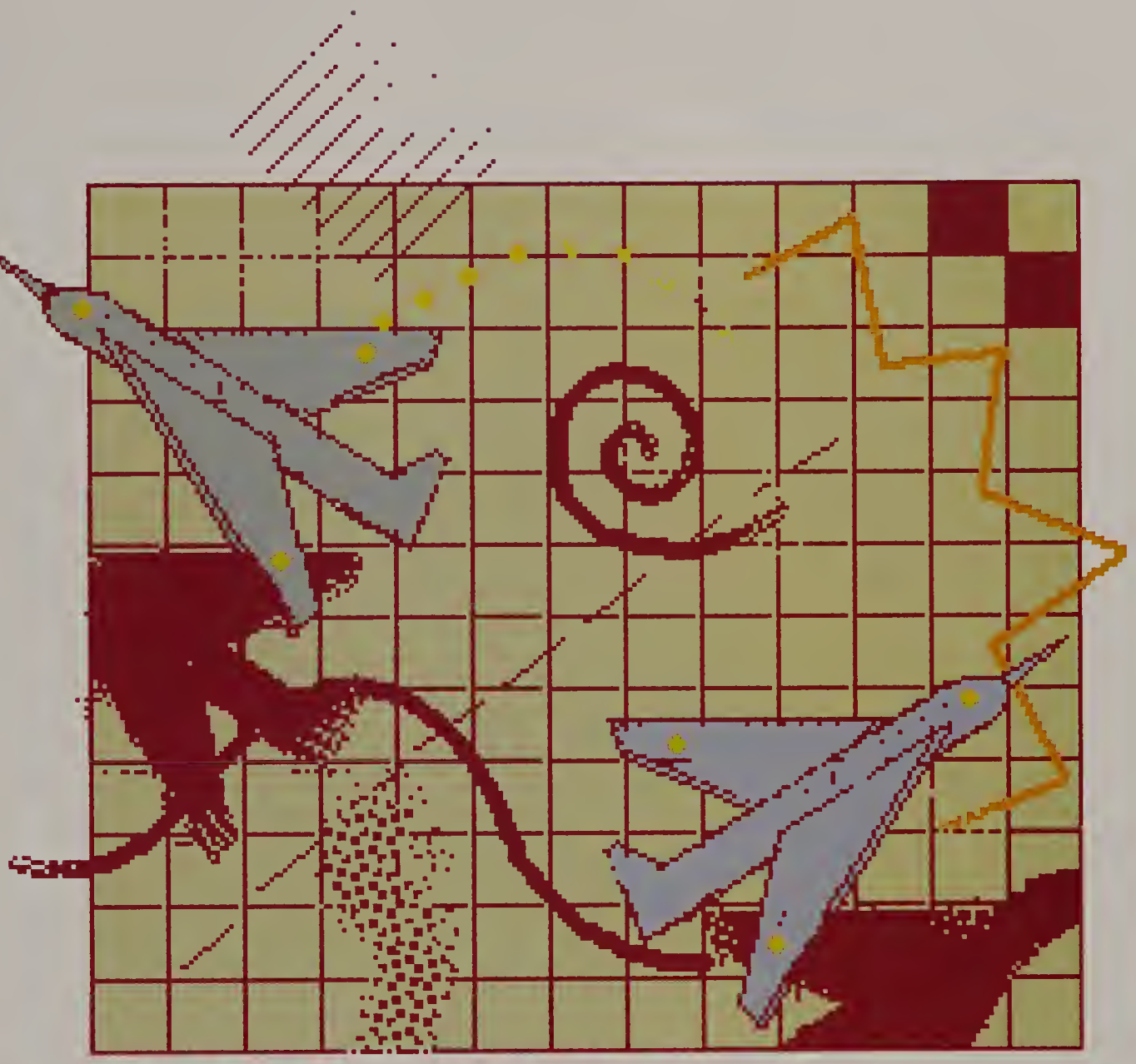
To say that this program has a lot of features is an understatement. *QUED/M* is among the most powerful Macintosh text editors available, including those bundled or integrated into some development systems.–*Jim Takatsuka*

See *Where to Buy* for product details.

Fry the Unfriendly Skies

Tactical Jet Fighter *1.0*

Flight simulation game. ***Pros:*** *Very simple to begin playing; provides no-frills combat action.* ***Cons:*** *Eliminates critical real-life aviation and combat hazards; does not provide complete takeoff-to-landing simulation.* ***List price:*** *$44.95.* ***Requires:*** *128K.* ***Copy protection:*** *Key disk.*



Tactical Jet Fighter is an air-to-air/air-to-ground combat game with simplified flight simulation features. This stripped down, straightforward shoot-'em-up assumes that you're not interested in learning all the details of flying an airplane before nose-diving into action. Although some skill-building time is required, particularly for players with no previous flight simulation experience, learning is relatively quick; many complicated actualities have been left out, so you can begin play almost immediately. There is no scoring system, but the game's 16 missions maintain a fast enough pace to hold the action-crazed attention of many Top Guns, if not of the more demanding connoisseurs of flight simulation.

Simplicity over Sophistication

You don't have to worry about takeoffs or landings–*Tactical Jet Fighter* is combat action without the down time. Each of the game's attack missions begins in the air, in a world approximately 100 miles square where there are stationary targets on land, sometimes protected by enemy jets, as well as other sketchy little shapes representing enemy tanks, railroad cars, and PT boats. Destroying all ground targets is the objective of each mission.

This game's Mach 1.5 jet will do wonders for your military budget–it comes with unlimited fuel. And like Rambo, *Tactical Jet Fighter* pilots never run out of cannon ammo, rockets, bombs, and guided missiles, though there are limits to how many weapons you may fire at once. As a further incentive to uninterrupted play (eliminating irritating restarts), you can fly smack into the ground and then take off again without being killed. Designed to keep the war machine going and the fun simple and nonstop, these features unfortunately also tame the contest considerably.

Limits and Flaws

Tactical Jet Fighter runs at good speed on the Mac 128K and 512K. But the programming priority of a quick frame rate also prohibits sound and reduces graphic detail. *Tactical Jet Fighter*'s on-screen aircraft control panel is a recognizable version of the real thing; the mouse functions as the pilot's joystick, and keys on the keyboard serve as controls. Four weapons systems are arrayed, as well as short- or long-range radar, pilot's viewpoints, throttle, brake, and landing gear (which is used for braking but not for landing). There is no keyboard option for stick control and no means to adjust the amount of tension or play in the stick, nor are there menus for customizing anything else. Simplicity cuts both ways.

Although *Tactical Jet Fighter*'s instruction manual admits it is different from "hi-fidelity flight simulation," it remains true that a lot more of everything is packed into the best-selling *Microsoft Flight Simulator,* including a realistic World War I dogfight. *Flight Simulator* can provide real pilot training, too, but it is not simple. If you burned out on Silicon Beach's *Airborne* but still need a fix of fast-firing action, you may enjoy the *Tactical Jet Fighter* workout, especially if it turns up at a discount price. Those who want more substantial graphics and sophisticated flight simulation should look elsewhere.

The fatal flaw (or nonfatal flaw) of *Tactical Jet Fighter* is that its pilots don't risk being shot down. You cannot be destroyed in a crash, stall during takeoff, or go into a spin after being hit. *Tactical Jet Fighter* is a thinly drawn game of target tag in which the player is "it," the target is usually stationary, and the enemy never shoots back. Rambo wouldn't even grease up for this one.–*Keith McCandless*

See *Where to Buy* for product details.



It's the highest achi to be both beautiful an

In the field of nature, the design skills of the hen and the spider have rightfully earned universal acclaim.

In the field of desktop publishing software, the same credentials apply to Letraset, leaders in graphic design for nearly 30 years.

And now Letraset proudly introduces its most recent achievement: Ready Set Go! 4.0™ page layout software for the Macintosh™ embodying the perfect balance of desktop publishing beauty and productivity.

For the artist in you, RSG! 4.0 offers innovative design features that allow you to produce pages that are excitingly creative.

Including automatic run-arounds that make it easy to create extraordinary visual effects. An elegant new tool bar that keeps your tool boxes accessible to each document you're creating. Powerful snap-to design grids that help you interactively place text and graphics and visualize designs as you go. Facing pages that allow you to view, edit and lay out a two-page spread. "Lock-and-Don't-Print" features that let you produce multiple pages for color overlays. And over 50 fill-and-pen patterns, based on Letraset's popular collection of rules and borders,



evement of great design d functional.

to create a variety of special graphics.

The practical side of you will be pleased to learn that RSG! 4.0 is also packed with a wide array of powerful time and effort saving production features.

For example, RSG! 4.0 comes equipped with full-function word processing and a built-in 100,000-word spell checker that can suggest correct spelling alternatives. Style sheets that let you make formatted changes throughout a one-page layout or an extensive multi-page document with a single keystroke. A linker tool that allows text to flow automatically as new text or graphics are needed. And RSG! 4.0 even boasts tabloid-size page formats up to a generous 99×99 inches.

In other words, RSG! 4.0 is the first page layout software of its kind. A tool for those who recognize that great design is the product not only of powerful creative resources, but of a genius for efficient production.

Any authorized Letraset graphic design software dealer will be glad to illustrate the above with a Ready Set Go! 4.0 demonstration. For the name of the dealer nearest you, just call (800)722-0377.

Letraset®
ESSELTE
Communication by design.

Copyright 1987 Letraset USA Ready Set Go! 4.0 is a trademark of Manhattan Graphics, Inc Macintosh is a trademark of Apple Computer Inc

Circle 598 on reader service card

Great designers have never accepted the limitations of reality. Neither should you.



Reality.



Reality Improved by ImageStudio.

INTRODUCING IMAGESTUDIO: RETOUCHING SOFTWARE FOR THE MACINTOSH.

Reality is notoriously uncooperative. Which is why designers have always taken liberties with it. And now, thanks to ImageStudio,™ you can do the same.

ImageStudio is the image processing software that transforms your Macintosh™ into one of the world's most versatile retouching studios.*

Electronic artist's tools let you handle everything from repair work on the Colosseum to airbrushed embellishments on your favorite illustration. Including softening or sharpening edges, changing brightness or contrast, scaling, cropping or rotating images, and more. Plus 64 shades of gray to work with.

ImageStudio not only accepts images from most scanners, it lets you use them in most page design software applications, including our own Ready Set Go! 4.0.™ And you can print them out on any PostScript®-compatible printer.

The result is printed materials designed to truly professional standards. Made possible by Letraset, the world's leading supplier of tools for those who put words and images on paper.

Visit an authorized Letraset graphic design software dealer for a demonstration. For the dealer nearest you, just call (800) 722-0377.

Letraset®
ESSELTE

*Requires a Macintosh Plus, SE or II. External disk drive required. Hard disk recommended. (c) 1987 Letraset USA. ImageStudio is a trademark of Esselte Pendaflex Corp. Ready Set Go! 4.0 is a trademark of Manhattan Graphics, Inc. PostScript is a registered trademark of Adobe Systems, Inc. Macintosh is a trademark of Apple Computer, Inc.

Circle 278 on reader service card

New Products

Information on the Mac's latest software, hardware, and accessories

Edited by Eileen Drapiza

This section covers Macintosh products formally announced but not yet evaluated by *Macworld*. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

Apache Strike and Beyond Dark Castle *Strike* allows the player to fly a McDonnell Douglas AH-64 Apache attack helicopter in between skyscrapers, fighting enemy helicopters, jets, and tanks while seeking out the enemy's strategic-defense computer. 3-D animation. In *Beyond Dark Castle* the hero battles through chambers filled with obstacles and bad guys. 512KE min. memory. $49.95 each. Silicon Beach Software, 619/695-6956.

Arrow Dynamic and Caspian PostScript Font Families The Arrow Dynamic family includes regular, bold, and heavyweight arrow sets featuring various background styles; accounts for all eight major compass points. Caspian is a calligraphic serif face. $43 per disk. EmDash, 312/441-6699.

Carousel Color Slide Software Design 35mm color slides from *MacDraw* and compatible object-oriented applications. Select from 256 colors per palette. Optional processing service provides 48-hour delivery. 512K min. memory; requires 1200-baud modem. $249. 20/20 Data Systems, 512/454-2508.

ColorLab Presentation program displays up to 256 colors on the Mac II, or transfers to 35mm color slides with a film recorder. Features include sorting, full centering, a transparent show-through option, and text coloring. Controlled or continuous operation. 1MB min. memory. $495. Language Systems Corp., 703/478-0181.

Comic People Clip art for use with *The Comic Strip Factory* or other *MacPaint*-compatible graphics programs. Contains seven new characters and an office background. $39.95. Foundation Publishing, 612/935-4230.

Complementary Type PostScript fonts for display, body copy, and borders: Highland Gothic, Highland Gothic Light, Fatti Patti, Vertigo, Cut Outs, Nouveau, Kasse, Hobnob, Fletcher Gothic, Peruta Medium and Light, Calculus, Michelle, Bodette Borders. Each disk contains at least two faces. $69 per disk. Software Complement, 717/491-2492.

Cricket Presents... Color presentation program. Integrates text handling and drawing tools; imports PICT files. 512KE min. memory. $495. Cricket Software, 215/251-9890.

Cyclesoft Training log for bicyclists. Includes calendar for setting goals; generates progress reports and charts. 512K min. memory. $49.95. Game Plan, 714/949-9599.

Desktop Publishing Type & Graphics *HyperCard* stackware version of the reference book. 1MB min. memory; requires *HyperCard*. $15. Publishing Resources, Inc., 303/442-1100.

Dessert Sampler Collection of 200 Mac graphics on disk. Available in a variety of formats. One-year subscription $249.50; includes catalog and disk. Moby Disk, Inc., 303/948-2678.

Different Drummer Lets your Mac become a drum machine, complete with snare and kick drum; ride and splash cymbals; high hat closed and open; tom lo, med, and hi; bell; hand clap; shaker; cowbell; and wood block. Records drumbeat patterns. 512K min. memory. $99.95. Primera Software, 415/525-3000.

FB Pro and TX81Z Pro Editor/librarian package for Yamaha's FB-01 and TX81Z synthesizers. FB Pro $129, TX81Z Pro $139. Digital Music Services, 714/951-1159.

ForeRunner Scripting utility for creating batch files. Bundled with Lock Out and Fast Formatter. 512K min. memory. $49.95. Beyond, 602/888-8667.

GraphPainter Presentation graphics program with curve fitting. 1MB min. memory. $50. Greg Brasel, 314/256-3317.

GYST Client-management database. Preset screens and data-entry fields may be customized. Includes an integrated appointment calendar/clock. 512K min. memory. $199. Contact Systems, Inc., 404/953-8242.

Handwriting Analyst Questions user about handwriting-sample shapes and formations, then analyzes and reports on writer's emotional characteristics, intellectual style, personality traits, social behavior, and vocational implications. 512K min. memory. $49.95 plus $3 shipping and handling. Ciasa, 415/644-2771.

HeadStart Customizable business database template for *dBase Mac*. Structured for personnel management, sales, marketing, accounts receivable/payable, and inventory. 1MB min. memory; requires *dBase Mac*. $169. DigiCorp, 801/562-2227.

(continues)

When you want to talk Macintosh

HARD DRIVES



CMS MACSTACK 20 **$599**

CMS
Pro-43 Internal for SE.....$799.00
Pro-821 Mac II.....1299.00
MacStack 40.....899.00
Ehman Engineering
20MB Hard Dive.....999.00
40MB Hard Dive.....1399.00
Everex
EMAC 20D.....599.00
EMAC 40D.....999.00
EMAC 91D.....1499.00
Lowdown
Lowdown 20.....849.00
Lowdown 30.....1099.00
Mirror Technologies
Magnet 20.....699.00
Magnet 30.....1049.00
Mountain
20MB With SCSI.....899.00
40MB With SCSI.....1499.00
Personal Peripherals
MacBottom HD21.....859.00
Macbottom HD21M.....999.00
MacBottom HD32.....999.00
MacBottom HD32M.....1199.00
Proapp
Proapp 20S.....699.00
Proapp 40SEI.....1049.00

MODEMS

Everex
EMAC Md 2400.....299.00
Hayes
Hayes Mac 1200.....439.00

DRIVES WITH TAPE BACKUP

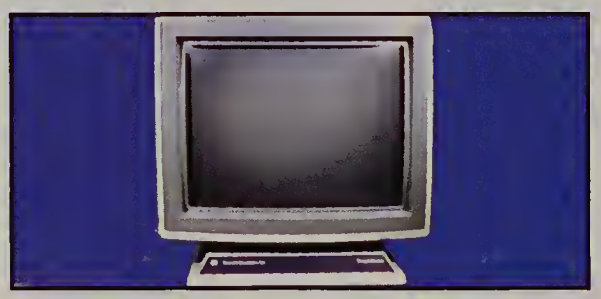
Everex
EMAC 40/60.....call
EMAC 91/60.....call
Mirror Technologies
Magnet 40/40.....2199.00
Magnet 85X.....3399.00
Mountain
80MB Fixed/20MB Removable.....3499.00

FLOPPY DRIVES

Ehman Engineering
800K External.....199.00
Mirror Technologies
Magnum 800K External.....209.00

MONITORS

Magnavox
Multimode for Mac II.....499.00
Mega Graphics
Magascreen II Video System.....1699.00
Megascreen SE Video System.....1699.00
Megascreen Plus Video System.....1699.00



Network Specialties 20″ Stretch Screen **$1599**

Nutmeg Systems
Nutmeg/Xerox Full Pg Display.....1299.00
Proapp
Eye Save Monitor.....319.00
Radius
Full Page Display.....1499.00
Two Page Display.....2199.00
Sigma Designs
Laserview SE 15″.....1499.00
Laserview SE 19″.....1899.00
Laserview II 19″.....1899.00

MEMORY BOARDS

Dove Computer
MacSnap 524.....call
MacSnap 548.....call
Macsnap Plus 2.....call
Macsnap Plus 2H.....call
MacSnap 4S.....call
MacSnap 2S.....call
MacSnap 524E.....call
MacSnap 524S.....call
MacSnap 548H.....call
MacSnap548E.....call
MacSnap 548S.....call
Tool Kit.....16.99
Head Cleaning Kit.....79.99
MacMemory
E Machines Adaptor Kit.....119.00
Multisimms 2MB.....call
Multisimms 4MB.....call
Turbo Drive 40 SCSI.....call
Turbo Max.....999.00
Turbo SE.....419.00
Maxplus Mega 2MB.....349.00
Maxram/Maxprint.....35.99
68881 Math Coprocessor.....369.00

TAPE BACKUP

AST
AST 2000.....1599.00
AST4000.....4199.00
Everex
EMAC 60T.....1099.00



Mountain 40MB 20MB Removable **$2699**

Mountain
20MB Removable Bernoulli.....1499.00
Dual 20 Removable Bernoulli.....2199.00

To Mac users, we are the new kid on the block. To more than 400,000 satisfied PC customers, we're an old friend.

Mac Center

Call now for fast, friendly service on the widest selection of Mac hardware and peripherals.

.....you want to talk to us.

SOFTWARE

Aegis Development
Doug Clapps Word Tools.....$45.99
Affinity
Tempo.....55.99
Altsys
Fontastic Plus.....52.99
Ann Arbor Softworks
Full Write Aug.....169.00
Full Paint.....54.99
Ashton Tate
dBase Mac.....319.00
Berkley Systems Design
Stepping Out.....59.99
Blythe
Omnis 3+.....319.00
Multiuser 3+.....639.00
Borland
Sidekick.....59.99
Reflex.....59.99
Turbo Pascal.....59.99
Brainpower
Stateview 512 Plus.....199.00
Broderbund
Print Shop.....39.99
Central Point
Copy II Mac.....23.99



Cricket Software
Cricket Draw **$169**

Cricket
Cricket Graph.....119.00
Statworks.....74.99
Data Tailor
Trapeze.....169.00
Data Viz
MacLink Plus with cable.....129.00

SOFTWARE

Debena
Coach.....$69.99
Coach With Thesaurus.....79.99
Coach Professional.....159.00
Comment 1.1.....69.99
Canvas.....159.000



Firebird Licensees
Laser Author **$119**

Infosphere
Intermail.....259.00
Innovative Data Design
Mac Draft.....159.00
Letraset
Ready Set Go. 4.0.....399.00
Lundeen & Associates
Works & Spell.....39.99
Microsoft
Multiplan.....109.00
Word 3.1.....239.00
File.....109.00
Excel.....219.00
Neshoba
File Maker Plus.....159.00
Silicone Beach
Super Paint.....89.99
Silicon Press.....49.99
Software Discoveries
Merge Write.....33.99
Software Power Company
Power Up.....39.99
Springboard
Certificate Maker.....34.99
Symetry
Acta V 2.0.....59.99
T/Maker
Write Now.....99.99

ACCESSORIES

Allsop
Disk File 10 Holds 10 3½" Micros.....$3.99
Disk File 30 Holds 30 3½" Micros.....9.99
Cleaning Kit for 3½" Disks.....15.99
Curtis
3 Outlet, Duplex/Filter.....48.99
6 Outlet, 6'Cord/Filter.....48.99
6 Outlet, 6' Cord/Duplex.....29.99
6 Outlet, Duplex/Wall.....49.99
Power Conditioner.....169.00
Kalmar Designs
Teakwood Disk Cabinet for 3½".....13.99
Kensington
Turbo Mouse.....77.99
Turbo Mouse ADB.....77.99
System Saver.....63.99
Tilt/Swivel.....21.99
Disk Drive Cleaning kit.....19.99
Microcomputer Accessories Inc.
MacIntosh Valet.....109.00
PTI/Datashield
S-85 Surge Protector.....59.99
S-100 Surge Protector.....69.99
Power Center 5 Switched outlets.....89.99
Power Center Modem Protection.....119.00

DISKS



Maxell 3½"
DS/DD Disks **$19**

Maxell
Maxell 3½" SS/DD.....12.99
Sony
Sony 3½" DS/DD.....19.99
Sony 3½" SS/DD.....12.99
Brother
MacDriver for 512, 512E Plus.....99.99

CMO **MacCenter**

In the U.S.A. and in Canada

Call toll-free: 1-800-233-8950

Outside the U.S.A. call 717-327-9575, Telex 5106017898, Fax 717-327-1217
Educational, Governmental and Corporate Organizations call toll-free 1-800-221-4283
CMO. 477 East Third Street, Dept. N1, Williamsport, PA 17701
ALL MAJOR CREDIT CARDS ACCEPTED.

POLICY: Add 3% (minimum $7.00) shipping and handling. Larger shipments may require additional charges. Personal and company checks require 3 weeks to clear. For faster delivery use your credit card or send cashier's check or bank money order. Pennsylvania residents add 6% sales tax. All prices are U.S.A. prices and are subject to change and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be replaced or repaired at our discretion within the terms and limits of the manufacturer's warranty. We cannot guarantee compatibility. All sales are final and returned shipments are subject to a restocking fee.

Circle 371 on reader service card

Inside Out Database toolbox for programmers. Supplied in linkable object code; includes a set-up program for defining database schema. 1MB min. memory. Single-user program tools $395, multiuser program tools $595. Shana Enterprises, 403/438-6548.

Insight Inventory Control, Multi-User Modules, and OneWrite *Inventory Control* monitors stock levels and maintains inventory valuation. *Multi-User Modules* allows several users to work on records simultaneously. *OneWrite,* modeled after the balance-forward accounting method, is intended for small service companies. 512KE min. memory. *Insight Inventory Control* $595, *Insight Multi-User Module* $895, *Insight OneWrite* $299. Layered Inc., 617/242-7700.

Jam Session Lets inexperienced players create and record professional-sounding music on the Mac. 512K min. memory. $49.95. Brøderbund Software, 415/492-3200.

LearnMore Three self-paced *More* tutorials. Covers fundamentals, tree and bullet charts, and tips and templates. $49.95 each, plus $5.95 shipping and handling. Personal Training Systems, 408/559-8635.

Loan Qualifier Templates for *Jazz, Crunch, Microsoft Excel,* and *Works.* Qualifies clients and calculates loan costs. Designed for mortage brokers, loan officers, and real estate agents. $99. Financial Microware, 408/733-6705.

MacLinkPlus/Wang VS Provides complete access to the Wang VS system. Includes Wang VS workstation emulation, and file-transfer and document-conversion capabilities. 1MB min. memory. $395. DataViz, 203/866-4944.

McMax dBase-compatible database-management system. Supports Microsoft formats. 512KE min. memory. $295. Nantucket Corp., 213/390-7923.

On Call Interactive medical adventure game with text, sound, and animation. 512K min. memory. $15. Goose Creek Software, 803/553-1805.

PageMaker Portfolio: Designs for Business Communications Package of 18 templates for proposals, memos, overhead transparencies, reports, handbooks, and business plans. 512K min. memory; requires *PageMaker.* $99. Aldus Corp., 206/628-2375.

PIXymbolsKeys and PIXymbolsTwo *PIXymbolsKeys* consists of downloadable PostScript pictorial fonts as well as screen fonts of all Mac-keyboard keys. *PIXymbolsTwo* includes more than one hundred additional characters. 512KE min. memory. $50 each. Page Studio Graphics, 602/839-2763.

Plundered Hearts Interactive romance fiction set in the seventeenth century. You are a young woman voyaging on a schooner bound for the West Indies. $39.95. 512K min. memory. Infocom, 617/492-6000.

PsychroMouse Engineering software that calculates psychrometric properties for cooling loads. 512K min. memory. $79.95. TechWare, Inc., 816/782-1249.

Rendezvous Electronic calendars in 12-month-perpetual, weekly, and 24-hour-day formats. Records notes in a centralized database; has search capability. Includes an automatic appointment reminder and a mini word processor. 128K min. memory. $200. PMC Telesystems, 604/255-9949.

StatView II Statistical data analysis and color graphics package for the Mac II. Analyzes a full range of statistics at mainframe speed; lets you customize graphs. Requires Mac II or SE/Plus with 68881 coprocessor. $495, demo disk $15. Abacus Concepts, 415/540-1949.

Super 3D 3-D color graphics modeling and animation for professional engineering and graphic arts applications. Rendering tools include perspective, hidden-surface removal, shading, color, and sophisticated shapes. Enhanced version takes advantage of Mac II color capabilities and the 68881 math coprocessor chip. 512KE min. memory. *Super 3D* $295, *Super 3D Enhanced* $495. Silicon Beach Software, 619/695-6956.

Trust & Betrayal: The Legacy of Siboot Interactive science fiction in which players strive to acquire power. 512K min. memory. $49.95. Mindscape Inc., 312/480-7667.

HARDWARE

The Big Picture for the Mac II 32-bit video controller and an ECL video signal. 17-inch monitor with 1024- by 808-pixel resolution; paper-white phosphor. Video card and monitor $1995, video card $795. E-Machines, 503/692-6656.

JDL-850 GL+ Plotter for 2-D/3-D drafting applications. Produces color plots on media up to 18 by 24 inches; handles shading, dithering, and polygon-fill tasks required in 3-D modeling. $3845. JDL Inc., 805/495-3451.

LaserView for Mac II Displays four shades of gray and two resolution modes: 1664 by 1200 pixels, or 832 by 600 pixels. Landscape mounted; paper-white phosphor; 75-KHz scan frequency. Refreshes at 60 Hz, noninterlaced; 160-MHz bandwidth. 15-inch screen $1595, 19-inch screen $2395. Sigma Designs, 415/770-0100.

MacADIOS II Ten boards for scientific and engineering applications, such as laboratory data acquisition, speech analysis, signal generation and analysis, and external process control and monitoring. $1500 to $10,000. GW Instruments, 617/625-4096.

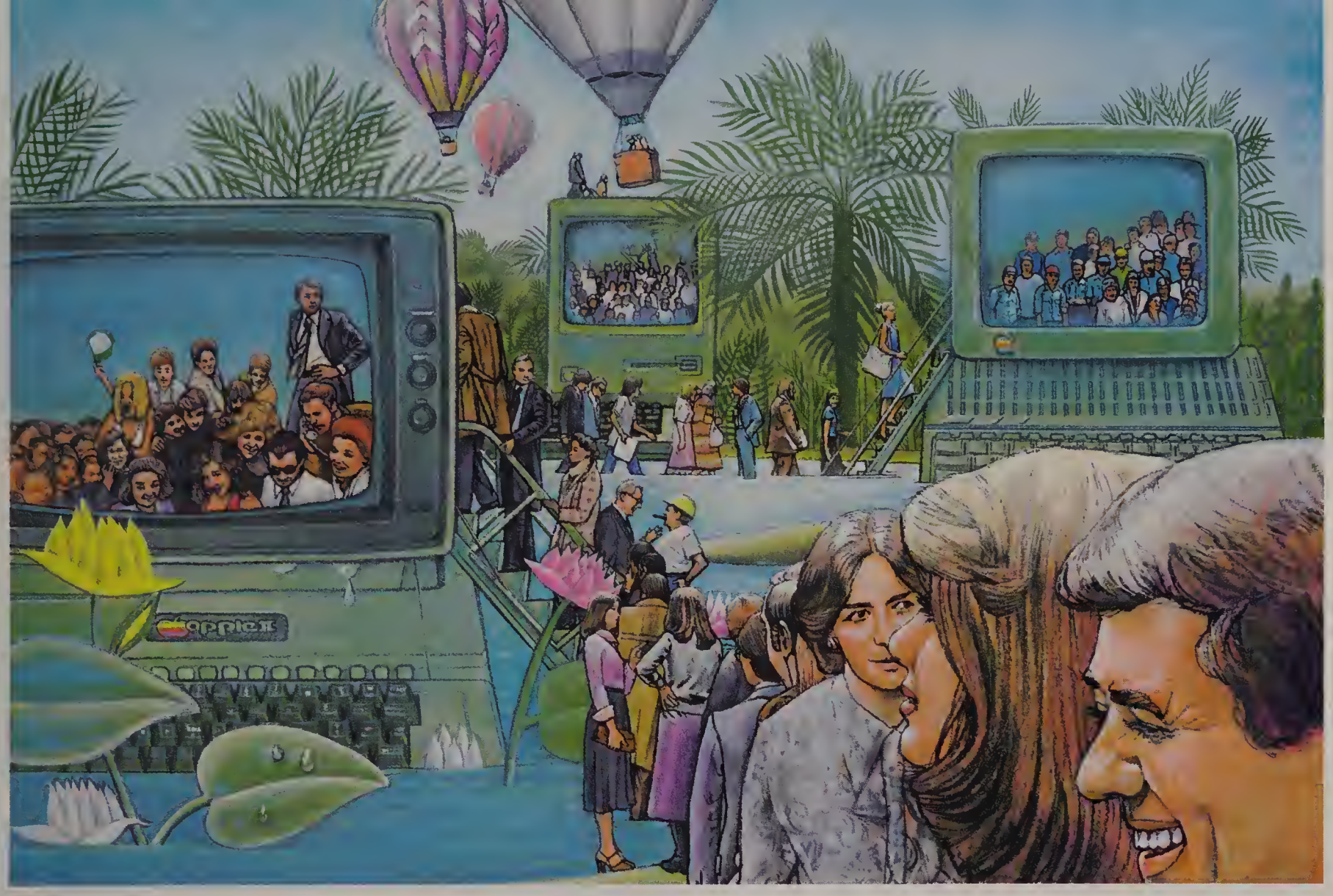
Mac&Touch Glass touch screen with mouse-compatible software driver. $995. MicroTouch, 617/935-0080.

MacPBX Integrates a Mac with any PBX system. Controls phone lines from Apple menu. Includes telephone-line interface. $249. Computer Phone Solutions, 305/653-4500.

Moniterm Viking 1 19-inch monochrome monitor for Mac SE. 1280- by 960-pixel resolution. 66-Hz refresh rate, noninterlaced; features extend, magnify, and WYSIWYG display modes; hardware screen saver. $1995. Moniterm Corp., 612/935-4151.

MSC Color Display Card 1280 by 1024 pixels, 32 bits per pixel. One, two, three, or four color planes of 8 bits each, RGB, and YMCK color processing; vertical refresh from 40 to 70 Hz, software-selectable; RGB Sync standard output (fourth channel optional); genlock and three or four inputs for frame-grabbing. External add-on hardware fully supported. Approximately $2500. Micro Systems Consultants, 818/997-0408.

(continues)



USE THE BRAINS YOUR APPLE WASN'T BORN WITH.

Right at your fingertips in CompuServe's Apple® Forums.

Our Apple Forums involve thousands of users worldwide who will show you just how easy it is to get the most from your Apple or Macintosh.®

Join the CompuServe Apple II and III Forum and explore thousands of classic programs. Try our Macintosh Users Forum for information on peripherals, music, graphics and user-supported software. Check out the Apple Developers Forum for instant updates and support. Use the Macintosh Business Forum to find out about desktop publishing and business.

Information you just can't find anywhere else.

Download first-rate, non-commercial software, shareware and utility programs. Upload your own programs free of connect time charges.

You can use the Forum Message Board to send and receive electronic messages. Join ongoing, real-time discussions in a Forum Conference. Communicate with industry and Apple experts. Enjoy other useful services too, like electronic editions of popular computer magazines.

Standard rates, 24 hours a day.

CompuServe's standard online charges are as low as 10¢ a minute. This low-cost standard rate is in effect 24 hours a day, every day. And in most areas, you can go online with a local phone call. Plus, you'll receive a $25.00 Introductory Usage Credit when you purchase your CompuServe Subscription Kit.

To buy your Subscription Kit, see your nearest computer dealer. To receive our free brochure, or to order direct, just call. If you're already a CompuServe subscriber, type GO MAUG® (Micronetworked Apple Users' Group) at any ! prompt to see what you've been missing.

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, Ohio 43220

800-848-8199

In Ohio or Canada, call 614-457-0802
An H&R Block Company

Circle 330 on reader service card

Announcing the publications you really

We've just rendered your current Macintosh media schedule obsolete. Because now, we publish the *only* two magazines you really need to reach — and own — the entire Macintosh market.

Macworld, of course, leads the way and is the #1 monthly Macintosh periodical with a circulation reaching 200,000 in January. It's aimed at all educated business market users: From government to universities, from science to home to businesses of any size. It's instructional, with an average of 20 in-depth product reviews per month. It's comprehensive, with departments including Macworld News, Verbatim, New Products, a variety of "how to" articles, Macintosh Best Sellers, even Where to Buy information. Because of all this, it's become a "must" media buy in reaching the wide Macintosh audience.

And now, there's *Macintosh Today.* It's the premier newspaper for news and information for the Macintosh market. Reaching users in large and medium size companies.

It delivers late-breaking news and product announcements, along with the hottest information to keep its readers on top. It provides solutions to personal computing problems, commentary on emerging industry trends, as well as updates on desktop publishing, office automation and desktop communications.

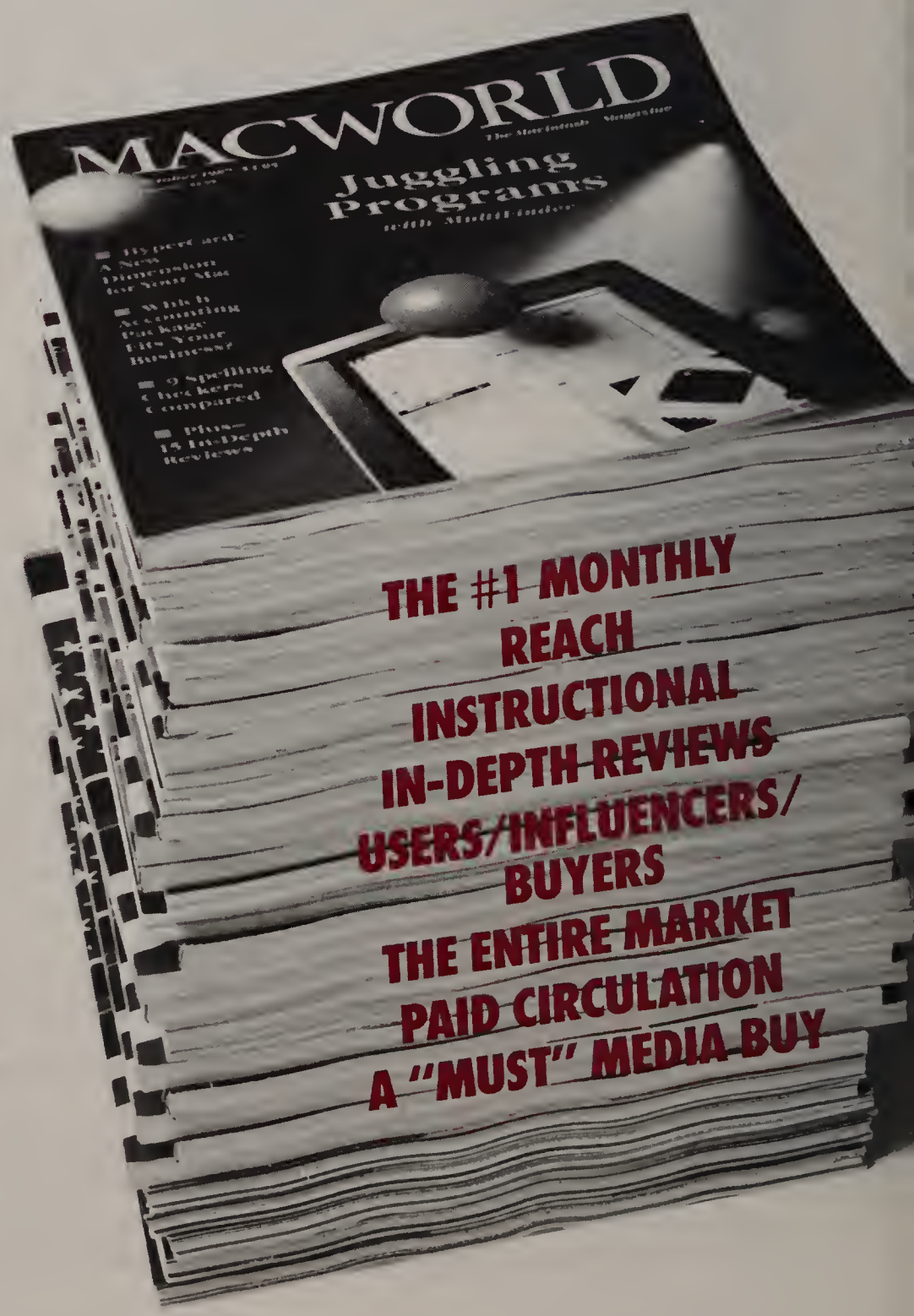
The 1-2 media punch of these synergistic PCW publications will give you unparalleled Macintosh market clout. So buy them together now, and we'll even give you a joint media discount. And you'll own the entire Macintosh market, for less.

Call us today at (415) 546-7722. Ask for Jim Martin, V.P. and Group Publisher. We'll make your job easier while your Macintosh media dollars work a lot harder.

PcW PCW Communications, Inc.

Boston / New York / Dallas / Atlanta / Chicago / Los Angeles

© 1987, PCW Communications, Inc.,



only two Macintosh need to own the market.



&

Re-ink Your Printer Ribbon for Less than 5 cents



MAC INKER™, the automatic ribbon re-inker. Over 100,000 sold - over 11000 printer cartridges and spools supported - with the Universal unit. Our dark dot matrix ink, lubricated and solid-free, yields a truly better than new print quality and helps extend print head life. We have a full range of optional accessories, special inks and cartridges: UV resistant, indelible, OCR, heat transfer. Color: red, green, blue, yellow, purple, brown, orange, silver, gold. In 1982, we pioneered ink and re-inking technology and are committed to its advancement.

$42.00
Mac Inker™ Imagewriter I & II
complete with
free bottle of ink

Universal Mac Inker **68.50**
Multicolor Adaptor* for 4 color band Imagewriter cartridges **40.00**
Shipping **3.00**
*fits both the Imagewriter Mac Inker or the Universal Mac Inker

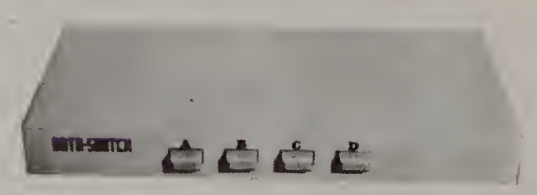
Mercury and Capricorn Modems



All our modems are 100% (guaranteed) Hayes compatible and have a 2 years warranty. Full, front panel control lights, auto answer, auto dial, auto repeat, call progress monitoring and speaker control.

Mercury 1200 AT 300/1200 baud **149.00**
Mercury 2400 baud **249.00**
Capricorn World Minimodem. 300/1200 baud, pocket size with Bell 103/212A & European CCIT V.21,V.22 standards **169.00**
Quick Link Communications Software (if purchased with Modem) **15.00**
Cable to Modem (specify Macintosh type) **15.00**

Data Switches for the Macintosh



MS4-MAC, 4 port, 9 pin female connectors mounted **50.00**
MS4-MAC8, 4 port, 8 pin, DIN-8 connectors (for the Plus,SE and MAC II) **50.00**
SCSI Switch - 2 port **46.00**
SCSI Switch - 4 port **59.00**
Cables **15.00**

Special Offer
When you order more than $100 tell us in which magazine you saw this ad and we'll give you a free key beeper, keychain and flashlight combined, a $15 value!

Order toll free 1-800-547-3303
In Oregon (503) 626-2291

Computer Friends, Inc.

14250 SW Science Park Drive
Portland, Oregon 97229
Dealer Inquiries Welcome

Circle 271 on reader service card

New Products

MSF-300 G Scanner 8-bit gray-scale desktop scanner. Downloads user-generated textured halftone images. Less than $4000. Microtek Lab, Inc., 213/321-2121.

PC Viewer Casts Mac screen image onto overhead projector. 640- by 480-pixel resolution. PCV 6448AV $1695, PCV 6448C $1895, PCV 6448C+2 $2495. In Focus Systems, 503/645-1551.

ProViz Video digitizer for desktop publishing. Produces screened halftones in PostScript output from any standard NTSC video source. 1MB min. memory. $1595. PixeLogic, 617/438-5520.

The Shadow Subsystem Two 86MB or 170MB fixed Winchester drives with two controllers and two power supplies and switches. Simultaneously writes data to both disks, but reads from only one. 30-ms average access. Model S0305-01 (86MB) $4395, model S4406-01 (170MB) $5995. Century Data Systems, 800/262-6743.

TransLink Transputer Modular parallel processing system for the Mac SE or II. Each T-800-based translink module has the processing power of a VAX 8600 (10 mips). Consists of TransLink boards, processor modules, and complete set of software development tools. Price to be announced. Levco, 619/457-2011.

ACCESSORIES

AutoInker Reinking machines for printer ribbons. Includes 2 oz. of ink. Dedicated reinker for ImageWriter $39.95, non-dedicated reinker $59.95. V-Tech, Inc., 215/822-2989.

Data Interrupt Eliminators Prevents accidental data loss when modems and telephones are used on the same line. Disables extensions while modems are used. $9.95 to $11.95. Data Spec, 818/993-1202.

MacAmber Screen Enhancer Filter for Mac Plus and SE changes the display to an amber color; reduces glare and ultraviolet radiation. $29.95. Sideways Solutions, 415/865-5357.

(continues)

SEND INFO ON:

DATA CELL
- ☐ 20MB ☐ 30MB ☐ 40MB
- ☐ 80MB ☐ 120MB ☐ 160MB
- ☐ OTHER _____

DATA FILE
- ☐ 40MB TAPE
- ☐ 40MB DISK/40MB TAPE
- ☐ OTHER _____

GIGA CELL
- ☐ 0.3OGB ☐ 0.45GB
- ☐ 0.6OGB ☐ 40MB TAPE
- ☐ OTHER _____

NAME: _____

COMPANY: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

PHONE NO.: _____

NuDATA

1MW

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1902 SANTA CLARA, CA

POSTAGE WILL BE PAID BY ADDRESSEE

NuDATA

3206 Scott Blvd.
Santa Clara, CA 95054-9904

GIGA CELL

NEW!



THE MEMORY THAT ROARS

Available at:
Heath/Zenith Computers & Electronics Centers

YOUR TRUE GIGABYTE MASS MEMORY SOLUTION

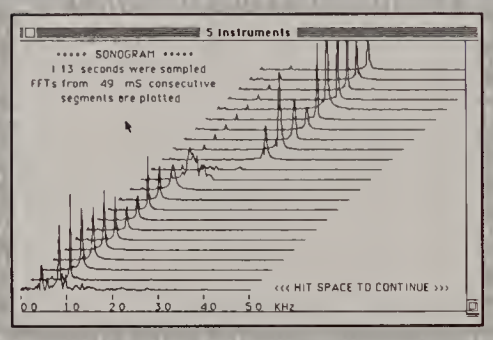
NuDATA

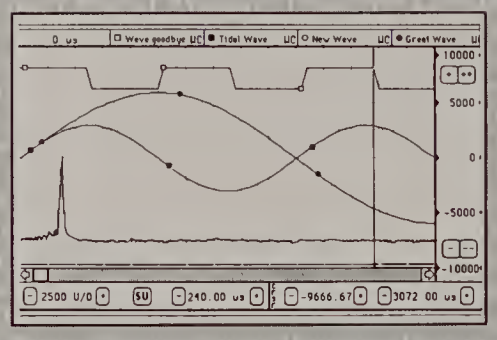
3206 Scott Blvd.
Santa Clara, CA 95054
(408) 727-1049
(800) 8-DATA-NU

They Chose Data Acquisition on the Macintosh

Free Catalog!

Performance that Challenges the Minis . . .





. . . with ease-of-use challenged by no one. MacADIOS systems from GW Instruments include advanced hardware interfaces and extensive software options for all Macintosh models. Programming control from BASIC, C, Pascal or FORTRAN, plus powerful "no programming" application software. Unprecedented 833 KHz sampling rate on the Macintosh II!

GW Instruments, Inc.

(617)625-4096 P.O. Box 2145 Cambridge, MA 02141

The Macintosh Data Acquisition Company

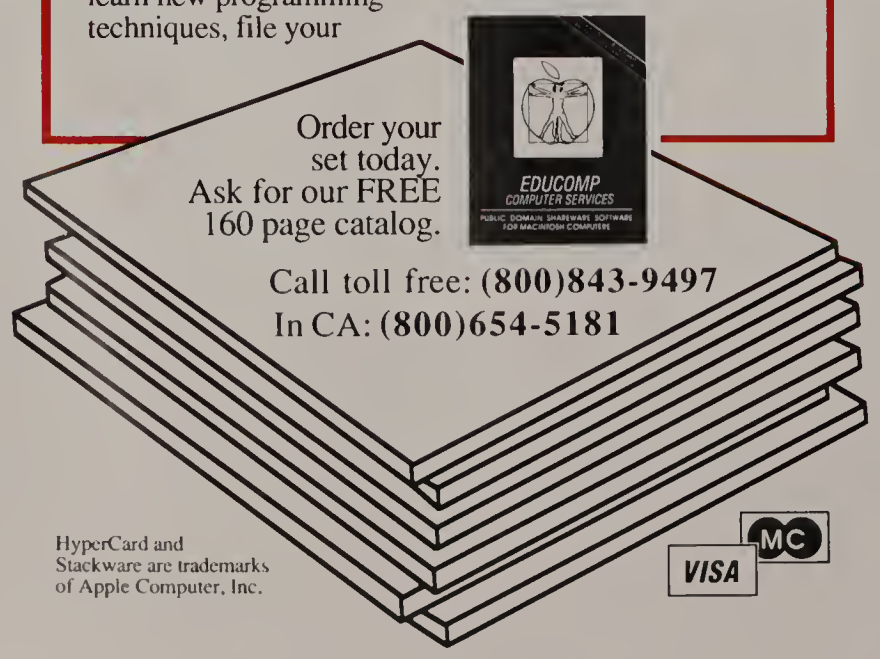
Circle 791 on reader service card

Fifteen Megabytes of

Stackware!

Whether you're a business person, publisher, student, parent, or hacker, there's something for you in the EDUCOMP StackPak! You'll receive 20 double-sided disks filled to the brim with "stacks" for Apple's HyperCard™. Balance your checkbook, learn new programming techniques, file your recipes, educate and entertain your family and much more! All 20 disks are only $99.95! These disks are also available individually for only $8.50.

EDUCOMP
742 Genevieve, Suite D-7
Solana Beach, CA 92075



Order your set today. Ask for our FREE 160 page catalog.

Call toll free: **(800)843-9497**
In CA: **(800)654-5181**

HyperCard and Stackware are trademarks of Apple Computer, Inc.

VISA MC

Circle 410 on reader service card

New Products

The Macintosh Valet A flexible, rotating arm that holds the Mac's mouse, disk drive, and keyboard 6 to 8 in. above desk surface. Platform rotates 90 degrees to left and right; arm extends to a 36-inch radius. Steel construction. $139.95. MicroComputer Accessories, 213/301-9400.

Mandale Power Shield Lightning and surge protector for complete electrical and electronic systems. $199.95. Mandale Corp., 919/376-9570.

ProTech Laser Ultra and Envelopes White glare- and curl-free paper for laser imaging. Coated for wax pasteup. Slightly oversized #10 envelopes in bright white let you print graphics and text in one pass on front and flap. Adhesives are heat resistant. 250 sheets of Laser Ultra $20.95, 100 envelopes $15.75. James River Corp., 800/521-5035.

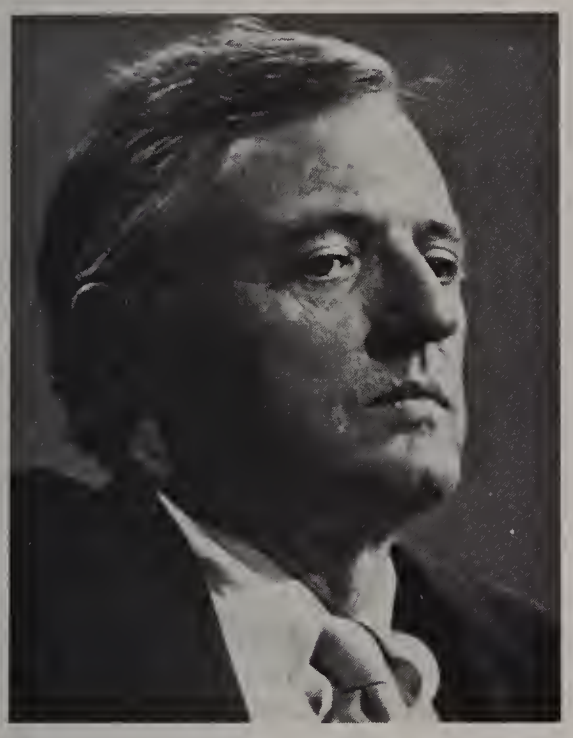
Quickcolor Formats Partially preprinted paper for overprinting. Accommodates a #10 trifold brochure, pamphlet, or self-mailer, with solid wraparound background color on the front and back panel. Colors include: Newport Blue, Kentucky Green, Georgetown Gray, and Cambridge Red. 100 sheets $9.95, 400-sheet rainbow pack $29.95. Intergraphix Corp., 617/331-8088.

TLP-2 Telephone-line/modem voltage surge protector. Plugs into standard three-prong AC wall outlets. Dissipates up to 6000 volts, 14,000 amps, 142 joules of surge energy. $39.95. Kalglo Electronics Co., 215/837-0700.

Wing Color Pack Adds colors to laser-printed documents. Includes materials for treating up to 50 pages. No additional hardware or software required. Starter pack $39.95. Wing Color, 800/541-0900. □

To have your product considered for inclusion in New Products, *send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor,* Macworld, *501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.*

DOES WILLIAM F. BUCKLEY, JR. REALLY NEED A THESAURUS?



If you've ever watched his show Firing Line, you know Bill Buckley to be one of the most articulate, erudite people who ever spoke the King's English. His superior vocabulary makes you lean forward in your chair to keep up with him. If anyone could get by without a thesaurus, he could. But we have his letter praising our comprehensive, contemporary Word Finder. No big words, just a nice letter saying how much he liked it and uses it. Didn't mention the 220,000 synonyms for 15,000 words. Didn't say anything about how in just seconds Word Finder performs the whole cycle of look-up and replacement, so you continue writing without taking your eyes off the screen or your fingers off the keyboard. Nothing about how simple it is—just select the word you want an alternate for, and up pops a window of synonyms. Pick a new word and the window disappears, and your new word takes the place of the old word. But he did say: "It's a bloody miracle. Word Finder has changed my life. I never used to use a thesaurus."* To order call 800-828-6293 (in New York State call 716-377-0130).

Word Finder installs as a desk accessory. It is not copy protected.

Retail $59.95

NEW FOR THE MAC®

*Mr. Buckley volunteered this statement about Word Finder, and is not being compensated for his endorsement.

Special Introductory Offer

Rush me **Word Finder** for $59.95 (Add $2.50 shipping: NY residents add sales tax)

☐ Visa ☐ MasterCard ☐ American Express ☐ Check ☐ COD

Card Number _____ Exp. Date ____/____

Name _____

Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

WORD FINDER® SYNONYM FINDER™

© Copyright 1987, Microlytics, Inc
Word Finder™ is a trademark of Microlytics, Inc.

Microlytics, Inc.,
300 Main Street, Suite 130, East Rochester, NY 14445 (716) 377-0130

(800) 828-6293

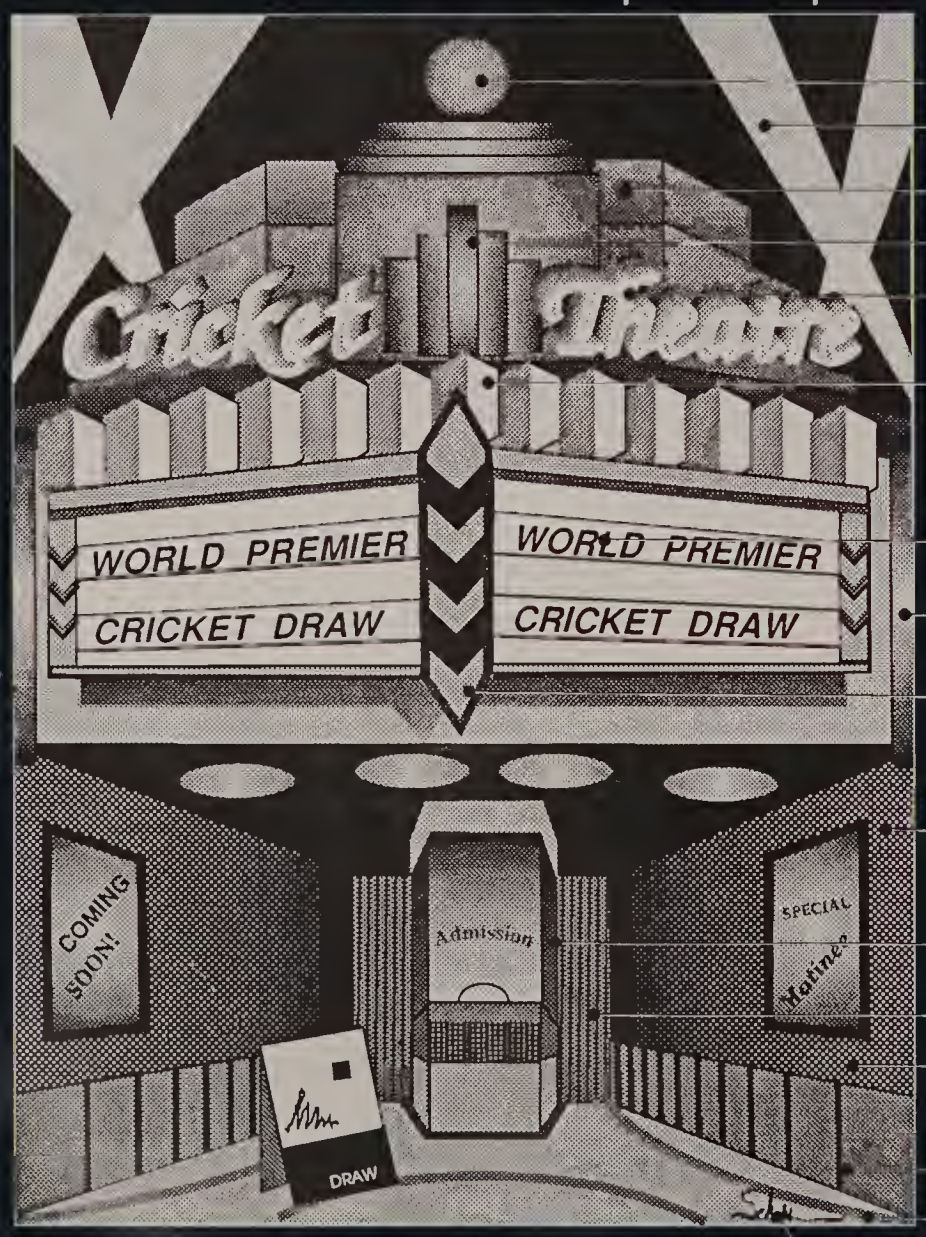
Dealers please call

Circle 774 on reader service card

cricket DRAW

FIRST IN SPECIAL EFFECTS

New! Version 1.1 Features Improved Speed



Printed with an Apple LaserWriter™

Every place you look you'll see rave reviews. Why? Because Cricket Draw has created a ***new*** *state-of-the-art in Macintosh drawing technology.*

Spectacular Special Effects

Cricket Draw's most universally acclaimed capability is its special effects generation. A quick glance at the example at left will give you a feeling for what can be accomplished with a little imagination and Cricket Draw. Graded Tones (fountains), Shading, Text on any path — all these effects and more are simple with Cricket Draw.

For Creators. . .

If you use your Macintosh to create graphics, then you certainly want the industry's most comprehensive set of drawing tools. You want the industry's most advanced text manipulation tools. And you want the ability to take full advantage of PostScript equipped devices. With the Power of Cricket Draw, you can finally unleash your true creative potential.

For Professionals. . .

Graphic Arts? Desktop Publishing? Cricket Draw allows you to create prescreened, camera-ready art, complete with typeset copy.



When it comes to Macintosh graphics software, there's just one name to remember — Cricket Software. Your local dealer will be happy to introduce you to the entire family: Cricket Graph, Cricket Draw, Cricket Presents. . ., and Cricket Device Drivers.

cricket software

Cricket Software, 30 Valley Stream Parkway, Great Valley Corporate Center, Malvern, PA 19355 (215) 251-9890

LaserWriter is a trademark of Apple Computer Inc. • Macintosh is a trademark of Apple Computer Inc. • PostScript is a trademark of Adobe Systems, Inc.



Quick Tips

Answers to your questions

by Lon Poole

The August *Quick Tips* included a tip about reducing the font size of a blank space to bring adjoining words closer together. Audrey Ramm of New York City suggests changing the font itself to make the blank space smaller. For example, if you use Geneva 12 and New York 10, changing spaces to Geneva 9 and New York 9 makes them smaller. Substituting Helvetica 9 and Times 9 makes the spaces smaller still. Conversely, using a font that takes up more room, such as Athens or London, will expand word spacing.

Q Switching Start-up Disks

When I eject a start-up disk, insert another start-up disk, and try to open an application on the second disk, the Mac asks me to swap disks. Why? Shouldn't it switch to any disk that contains the Finder?

Todd Andros
Coral Gables, Florida

A The Mac does switch start-up disks under the circumstances you describe. But it may ask you to insert the old start-up disk so that it can update that disk's invisible desktop file. (The desktop file keeps track of Get Info comments and icon and window arrangement.)

The Mac does not automatically switch start-up disks if the current start-up disk is a hard disk. However, you can force it to switch by pressing the Option key while you open an application on another start-up disk. You can also force a switch to another start-up disk by pressing the Option and ⌘ keys while opening the Finder icon. The Mac won't switch start-up disks at all if you're using MultiFinder.

Remember that a start-up disk must contain both the Finder and System files. On an 800K disk or any other disk that uses the Hierarchical File System (HFS), they must be in the same folder–usually the System Folder.

Q Em Dash

I need to use a long dash in my writing–as in setting off this phrase–but I don't want to use two hyphens as I normally do.

Paul Stobnicke
Syracuse, New York

A An em dash (—) is the usual replacement for double hyphens. You type it by pressing Shift-Option-hyphen. An en dash (–) is shorter than an em dash but longer than a hyphen. Type an en dash by pressing Option-hyphen.

You may also wish to use opening and closing quotation marks (for example, Hoagy Carmichael's "Stardust") instead of the usual simple tick marks (Four Tops' "Bernadette"). Type Option-[for ', Shift-Option-[for ", and Shift-Option-] for ". Use the Key Caps desk accessory to investigate other punctuation and characters you can use to bring your documents closer to typeset quality.

Q Temporarily Enlarged Text

A friend of mine has very poor eyesight and wishes to write and edit his 500-page book using an 18-point font. But he wants to reduce the entire document to 12-point size for printing. How is this possible without having to slowly highlight all that text?

Jeremy M. Brown
Brampton, Ontario, Canada

A There's a quick and easy method for selecting an entire document that works with almost every Macintosh word processor. First, click at the beginning of the document. Then scroll to the end of the document (by dragging the white box to the bottom of the vertical scroll bar). Finally, press Shift while you click at the end of the document. Some word processors have even simpler methods. In *Word,* for example, you move the pointer to the left edge of the document window (where it changes to point right instead of left), press ⌘ and click.

However, you may not always want to change an entire document to one font size. Headings may be larger than body text, for example. If your word processor has style sheets, you can use them to control the font sizes of different types of paragraphs independently. *Word* 3.0's Define Styles command gives you this ability.

A completely different approach is to use the application *InLarge* ($95 from Berkeley System Design, 1708 Shattuck Ave., Berkeley, CA 94709, 415/540-5536). It provides you with a "magnifying glass" whose size and strength you specify. The "glass" can magnify from 2 to 16 times and can be as small as 64 by 64 pixels (about ⅞-inch square) or as large as a whole screen. *InLarge* is specifically designed to assist visually impaired Macintosh users.

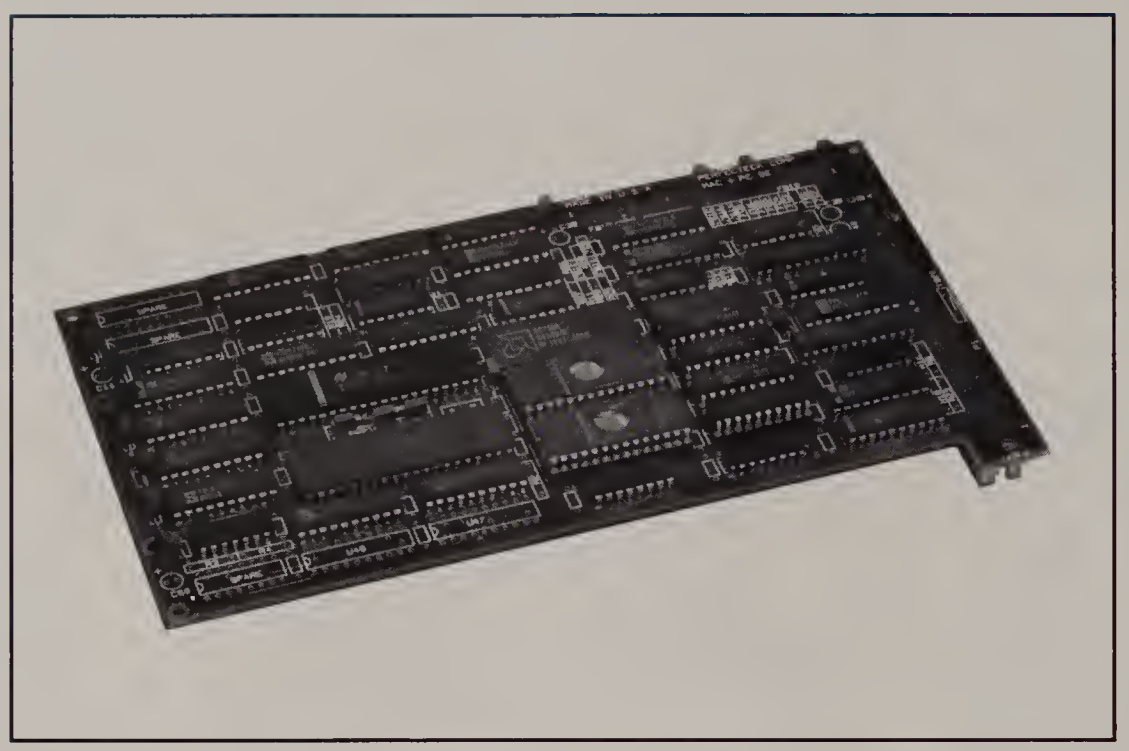
InLarge can also invert the display so that it's predominantly white on black.

Q MacDraw Out of Order

MacDraw works just fine on the Macintosh SE at my office but refuses to open a new document properly on my SE at home. I can open and edit an existing document, but a new "Untitled" drawing window shows up tinted gray, and none of the drawing tools work. I discovered that the program works fine if I start up with either the *MacDraw* disk or the System Tools disk, so I assume there must be something

(continues)

MS DOS™ BOARD
FOR YOUR MACINTOSH™ SE



The Mac+PC SE™ Co-processor Card from . . . PerfecTEK

Adds the following capabilities to your Macintosh

- Configure up to 640K memory for DOS, using 512K on board memory provided
- Download or run with third party 5.25″ SCSI diskette drives
- Use Mac 3½″ disk drives for DOS programs and data
- Dedicate or share Macintosh hard disk for DOS application
- Work in the multiprocessing environments of either "Switcher" or Multifinder™
- Use Apple Imagewriter/laser printers or IBM® compatible letter quality printers (option)
- Communicate with MS DOS compatibles using 2 Com.ports
- Emulate IBM CGA/MDA equivalent graphics in DOS window using Mac graphics
- Use our utilities to transfer files between Macintosh and MS DOS
- EASY INSTALLATION. PLUGS INTO THE SE EXPANSION SLOT

For further information, contact:

Marketing Department
PerfecTEK Corporation
726 South Hillview Drive
Milpitas, CA 95035
(408) 263-7757 Telex No. 984281

See us at San Francisco
MACWORLD EXPO
BOOTH #240
JAN 14 - 17, 1988

Mac + PC SE™ is a trademark of PerfecTEK Corporation. MS DOS is a trademark of Microsoft Corporation. Macintosh SE™ and Multifinder™ are trademarks of Apple Computer, Inc. IBM® is a registered trademark of International Business Machines.

Circle 670 on reader service card

wrong with the System file on my hard disk at home. I tried copying the System file from the System Tools disk to my hard disk, but I still have the same problem with *MacDraw*. What's wrong with my hard disk?

Charles T. Bohanan
Decatur, Georgia

A The System Folder on the start-up disk must contain a printer resource, or *MacDraw* (versions 1.7 and 1.9) will exhibit the symptoms you describe. Drag the ImageWriter or LaserWriter icon from the System Folder on the System Tools disk to the System Folder on your hard disk.

Q Hard Disk Partitions

Is there a utility available that allows SCSI hard disks to be partitioned into two or more parts so that they may be used as separate drives? I have a Mac SE with internal and external hard disks.

Jack Zhe
Freeville, New York

A I've used *Hard Disk Partition* version 1.05 with good results ($54.95 from FWB Software, 2040 Polk St. #215, San Francisco, CA 94109, 415/474-8055). It's a desk accessory you use to create partitions and to manually mount and unmount them. (Mounting a partition is analogous to inserting a disk; unmounting is analogous to ejecting a disk and dragging its icon to the trash.) Partitions can also be mounted automatically during start-up. Once mounted, a partition behaves like a regular disk.

However, *Hard Disk Partition* can only be used with the start-up disk (probably your internal hard disk). FWB Software is working on a new version that will work with more than one drive; FWB hopes to have it available early in 1988.

Two Word Word Counts

Tip: I used the tip in the September 1987 *Macworld* ("Insights on Microsoft Word 3.0") for counting words in a *Word* 3.0 document and discovered a quicker and simpler variation. With the flashing insertion point at the beginning of the document, choose Change from the Search menu. In the Change dialog, enter ^w in the Find What box, enter ^n in the Change To box, and click Change All. At the end of the operation, look at the lower-left corner of the document window to find the num-

(continues)



Why you should buy a mouse with no moving parts.

One simple reason. No moving parts. And that means no problems.

Introducing the A+ Mouse from Mouse Systems. The A+ Mouse is an all optical mouse with no moving parts. It doesn't depend on friction, so there aren't any parts that can slip, get dirty or wear out. It doesn't have a rolling ball, a commutator, little teeny bearings and shafts, or plastic housings housing who-knows-what.

Instead, our mouse uses a mirror-like pad that reflects a tiny beam of light to track your slightest hand movement. No other mouse moves as fast or is as reliable.

Especially when you're moving around in spreadsheets and graphics software or editing text and manipulating data. That's because our mouse gives you up to 200 counts per inch and digital accuracy for exceptional cursor control.

Plus solid state electronics to ensure precision.

No matter what Apple system you have, we have an A+ Mouse that's right for you.

The A+ Mouse is compatible with the Macintosh 512K, Macintosh Plus, Apple IIc and Apple IIe (which requires the Apple mouse card).

The A+ Mouse ADB is ideal for the Macintosh SE, Macintosh II, and Apple IIGS.

The A+ Mouse. The mouse you'll never have to clean, repair or replace. It's so reliable, it's the only mouse which comes with a Lifetime Warranty.*

See your local dealer for a demonstration. Today.



A+ MOUSE
MOUSE SYSTEMS

*Warranty limited to North America. Contact MSC Technologies for details. Apple is a registered trademark and Macintosh is a trademark of Apple Computer, Inc. Mouse Systems is a trademark of MSC Technologies Inc.
© 1987 MSC Technologies Inc., 2600 San Tomas Expressway, Santa Clara, California 95051 (408) 988-0211.

Circle 397 on reader service card

If We Didn't Build MicahDrives Better We Wouldn't Back Them 8 Times Longer!



Hard drives from the new Micah are made to the highest standards of any drives for the Macintosh™. That's why we offer a full 2 year limited warranty— 8 times the industry standard and double the warranty given by virtually every other hard disk manufacturer.

Compare Micah's Construction

- Automatic mechanical park & lock of drive heads on shut down.
- Exclusive shock mounting of the drive assembly.
- The ability to withstand bangs & bumps up to 65 g's (operational) and 160 g's (non-operational) without failure.
- Superior air flow for longer life.
- All external drives fit directly underneath the Mac, taking up no additional space and increasing height by 3".
- Internal drives are designed for installation by the user on all Macs from the 512 up to the Macintosh II™.

MicahDrives are sold and supported directly by the manufacturer for complete reliability, after-the-sale support and maximum value. After you've compared our construction, extras, prices and warranty you'll see why Micah is the hard decision that's easy to make.

Compare Micah's Extras

- "Plug & Play" right out of the box: drives are shipped with all parts and cables — No hidden costs or extras needed.
- All drives are fully formatted and tested at the factory and shipped with the latest System and Finder.
- Exclusive Micah Manager™ software is included for formatting/initialization, high performance partitioning, encryption and back-up/restore.
- Designed to add to the value and productivity of your computer, not to simply replace an existing drive. On the Macintosh SE™ that means you can have two floppies ***and*** an internal hard disk up to 60 MB. On the Macintosh II™ you can add up to 310 MB of additional internal storage while still keeping the floppy drive and the original Apple hard drive.

Compare Micah's Prices

External MicahDrives	
XT20 - 20 MB	$649
XT30 - 30 MB	$839
XT40 - 40 MB	$999
XT60 - 60 MB	$1199
XT100 - 100 MB	$1699
XT150 - 150 MB	$2399
Internal MicahDrives	
AT20 - 20 MB	$649
AT30 - 30 MB	$839
AT40 - 40 MB	$899
AT60 - 60 MB	$1159
AT100 - 100 MB	$1549*
AT150 - 150 MB	$1999*
AT220 - 220 MB	$3599*
AT310 - 300 MB	$4999*
*for the Mac II only	
External Tape Back-Up	
XTP-40 - 40 MB SCSI Tape Back-up System Includes one 40 MB Tape Cartridge	$999

Visa, MasterCard and American Express accepted at no extra charge.

Micah's guarantee of satisfaction: If you're not satisfied for any reason within the first 30 days we will refund the price of the drive.

To order or for more information call toll free

1-800-782-0097

If busy or calling from Delaware 302-731-0430 Facsimile 914-779-2849

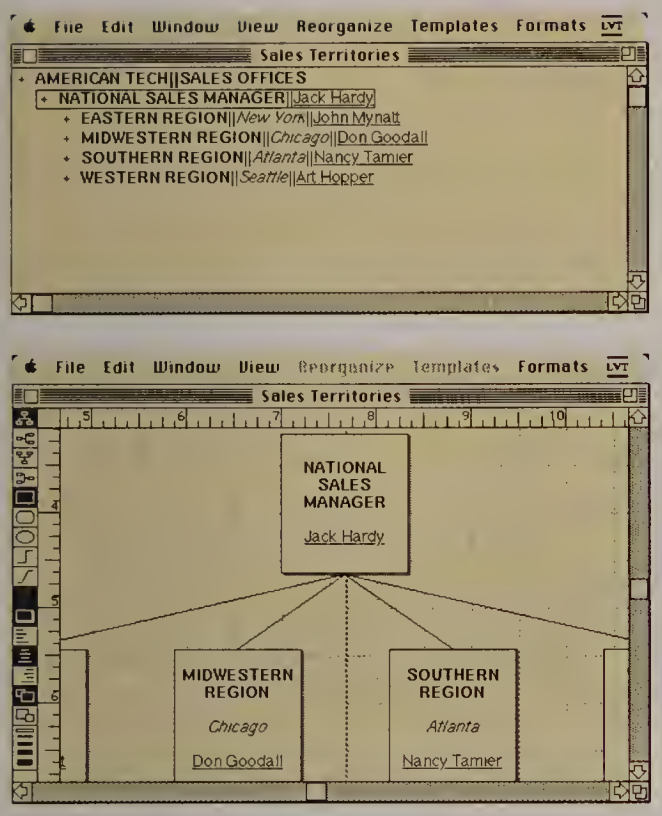
MICAH™

56 Worral Drive Newark, Delaware 19711

PowerUp™ Disk Optimizer, a $59.95 value is now included with every MicahDrive

Micah, MicahDrive and Micah Manager are registered trademarks of Micah Storage Systems and MDI. PowerUp is a registered trademark of Software Power Company. Macintosh, Macintosh SE and Macintosh II are registered trademarks of Apple Computer, Inc.

Circle 352 on reader service card



Dividing Line

In More, *double vertical lines (type Shift-backslash on the Plus or SE) divide headline text into multiple lines on a tree chart.*

ber of changes made. This number, plus or minus one, is the number of words in the document. Choose Undo from the Edit menu to restore your document to its previous state.

Ricky Adebanjo
Stanford, California

I'd suggest saving your document before beginning so you have something to revert to in case anything goes wrong. You might inadvertently do something that would make Undo impossible.

Tip: To count words quickly in a *Word* 3.0 document, simply divide the character count by 6.355. I derived this number of characters per word by dividing spell-checker word counts into character counts on the same documents and averaging the results. The deviation from this mean is low.

Mark Dowie
Point Reyes Station, California

The number of characters appears in the lower left-hand corner of the screen immediately after you open or save a Word *3.0 document.*

Split-Line Tree Charts

Tip: Here's a tip for anyone who uses *More* and does a lot of tree charts. When you create headlines, use the vertical line (Shift-backslash on the SE and Plus) to separate information that you want to have appear on individual lines when you change to tree charts [see "Dividing Line"].

Tim Smith
Jacksonville, Florida

Automatic Window Closer

Tip: If you hold down the Option key from the time you quit an application until you see the Finder menu bar, all previously opened windows will be closed. The desktop will appear much more quickly.

Ali Kaylan
Rochester, New York

You can also make the Finder forget that it ever opened a window by pressing Option while you open a disk or folder icon. However, neither of these Option-key tricks works with MultiFinder.

Overstrike Characters

Tip: It's easy to create special symbols and characters by combining standard

(continues)

100 HYPERCARD™ STACKS 25.00

It's not that we're charging too little... it's just that you've been paying too much! Here's 100 ready to run Public Domain and Shareware HyperCard™ stacks for your Macintosh. Included are stacks for business, productivity, home & personal, utilities, sounds, education, and entertainment. Most are unprotected so that you can gain ideas for creating your own exciting stacks! Other specials available: our DeskPAK 200™ collection of 200 different desk accessories, our FontPAK 200™ collection of 200 fantastic fonts, our ArtPAK 250™ collection of clip art, or our GamePAK 100™ collection of 100 exciting games. Each set available on 4 DS disks for only $25.00 (or $27.00 on 8 SS disks). Add $3.00 shipping and handling per order in US/Canada, or $10.00 to all other countries. We are determined to provide you with the very best in Public Domain and Shareware software at the most reasonable prices. We stock the latest versions of over 2700 different programs, games, artwork, DA's, fonts, educational, and business applications. At only $3.50 per single sided disk, or $6.50 per double sided disk. No minimum on cash purchases, no membership fees, ever! Just great software at honest prices. Discover the excitment of Public Domain and Shareware software for your Mac! Send $1.00 for our 100 page catalog fully describing all 2700+ programs, and start getting more bytes for your buck today!

Budgetbytes™
P.O. Box 2248, Topeka, KS 66601
HyperCard & Macintosh are trademarks of Apple Computer, Inc

To order call: 1-800-356-3551
Customer Service: 1-913-271-6022

Please remember to support Shareware by sending requested fees to authors!

VISA

Circle 301 on reader service card

13V"/14" Monitor for the Apple Macintosh II

Turn Your Apple Into A Diamond



The *Diamond Scan (AUM1371A)* from Mitsubishi Electronics is a 13V" auto-tracking color monitor fully compatible with the Apple® Macintosh™ II. Make the move to Mitsubishi today for all your Macintosh II needs.

- Auto-tracking
- Apple mode: 640 x 480 resolution
- Applications for presentation graphics, training, CAD/CAM and more
- Accepts TTL, analog, or television-type NTSC signals
- Tilt and swivel base available

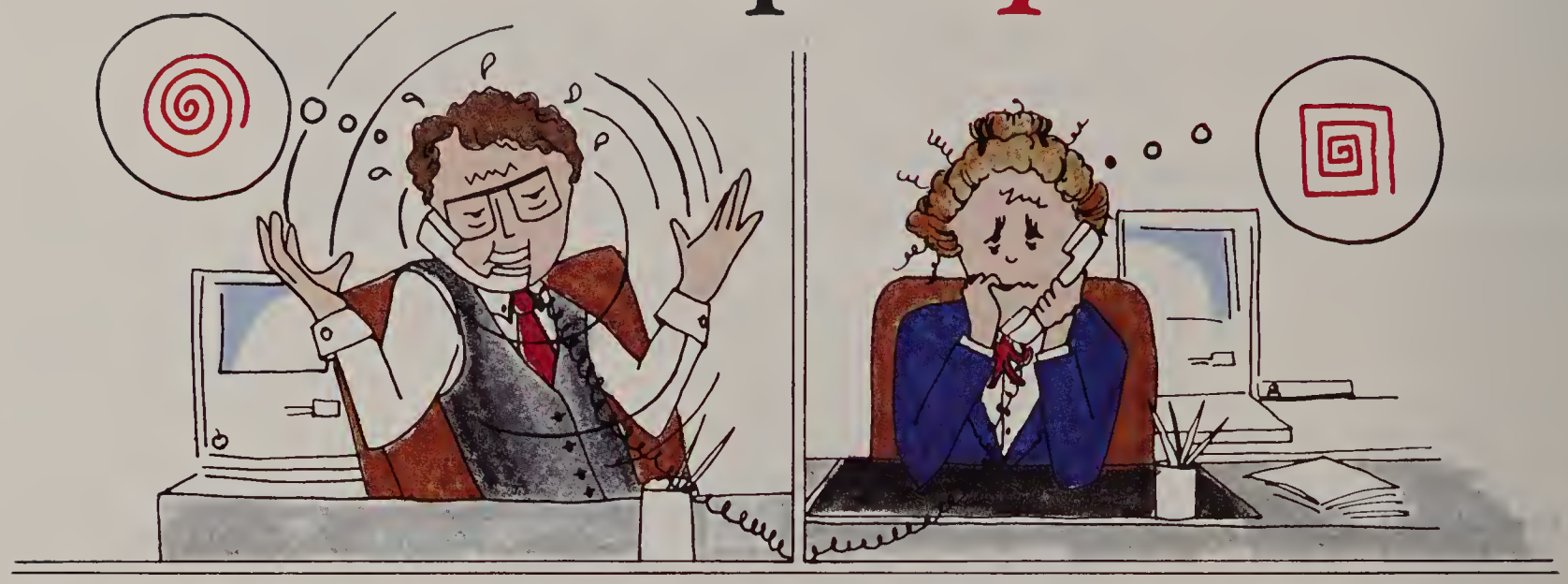
Mitsubishi Electronics America, Inc., Computer Peripherals Division, 991 Knox Street, Torrance, CA 90502. Telephone: (213) 515-3993, ext. 382.

MITSUBISHI ELECTRONICS

Apple is a registered trademark of Apple Computer, Inc.

Circle 640 on reader service card

Desktop *Express*™



because great minds seldom think alike.



The Meeting of the Minds With Desktop *Express*™ software, the great mind in New York can *see* what the great mind in L.A. has been trying to say.

Send text *and graphics,* using a Macintosh™, a modem and MCI Mail®, to your associates in the next office, or in the next state. With this new electronic mail and document delivery service, they'll get the picture clearly anytime – day or night – via MCI Mail.

Desktop *Express* extends the 5 o'clock "express" deadline, so working across time zones can be as efficient as working across the hall. And, it replaces those fuzzy facsimile figures and forecasts with high resolution graphic presentations. Send ideas back and forth in a matter of minutes and accomplish in an afternoon what would normally take several days of overnight courier exchange.

Created by Dow Jones, Apple, and MCI, Desktop *Express* works with the Macintosh software programs you've come to rely on. Create a business plan complete with charts, graphs and spreadsheets. Send it to any of your associates who have Desktop *Express*. They can review the plan and even print it – all *without* the software program you used to create it. But if they do have the program, and Desktop *Express*, they can revise your document on the spot and return it to you.

For your associates who don't own a Macintosh, Desktop *Express* still delivers. Direct your documents electronically to an MCI Mail Print Center. There they will be printed on a laser printer and delivered via postal or overnight delivery.

With Desktop *Express*, your big ideas will get looked over, not overlooked. So, for the Apple Dealer in your area call **1-800-538-9696 Ext. 350**.

Desktop *Express.* Now, great minds don't have to think alike to get the picture.

Dow Jones®

P.O Box 300, Princeton, NJ 08543-0300. Desktop *Express* is a trademark of Dow Jones & Company, Inc. © 1987 Dow Jones & Company, Inc., All Rights Reserved.

Circle 355 on reader service card

Symbol	Formula	Characters Combined
$\bar{X}$	.\o(X,.\s.\up11(_))	"X" and superscripted "_"
$\dot{P}_t$	.\o(P,.\s.\up12(.)).\s.\do5(t)	"P", superscripted ".", and subscripted "t"
$\underset{\sim}{Y}$	\o(Y,.\s.\do11(~))	"Y" and subscripted "~"

Combining Characters

Transform standard characters into special characters using Word *3.01's math-formula commands to combine the Overstrike and Superscript/Subscript commands.*

characters using *Word* 3.01's commands for typesetting math formulas. This avoids the hassle of creating special fonts or having to use *MacDraw* or *MacPaint* to draw special characters and then paste them into the *Word* document. To create special characters, combine the Overstrike command and the Superscript/Subscript command. For some examples of symbols often used in statistics and economics, see "Combining Characters."

Stuart M. Glosser
Whitewater, Wisconsin

While typing formulas, be sure the Show ¶ option is active (choose Show ¶ from the Edit menu). When you finish typing the formula, choose Hide ¶ from the Edit menu to see the results.

Be sure to prefix every formula command and ⌘ option with the formula character, which you type by pressing Option-⌘-backslash. Word *displays this character as a backslash preceded by a dot (.\).*

The Overstrike command superimposes two or more characters. Options let you align the superimposed characters at their centers, left edges, or right edges. The Displace command is similar to the Overstrike command. Displace lets you space forward or backward any number of points between two characters to make them overlap.

The Superscript/Subscript command moves a character up or down the number of points you specify. Keep in mind that if you change fonts, styles, or font sizes, you may have to adjust the number of superscript or subscript points.

The Word *manual and online help have more information on formula commands. Look under "Formulas."*

E-Z Row, Column Insertion

Tip: I found this shortcut the other day in *Excel* 1.04. When working on a worksheet or macro, press the Option key and click or drag a row, column label, or cell to quickly insert single or multiple rows, columns, or cells.

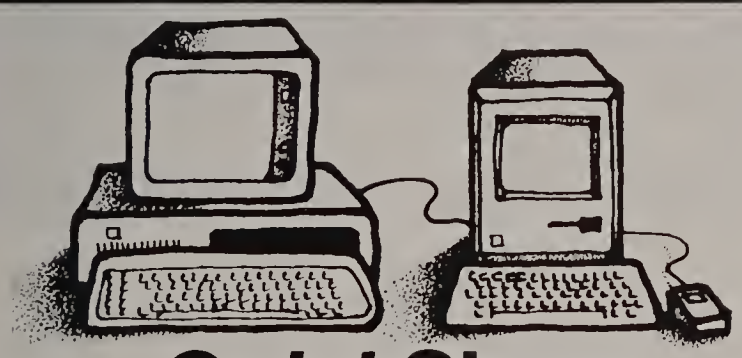
Barry J. Lutz
Chicago, Illinois

Quick Eject in Font/DA Mover

Tip: To eject a disk while using Font/DA Mover, hold down the Option key and click the Close button. This saves the time and trouble of clicking Close, then Open, and finally Eject.

James Staudte
Burke, Virginia

(continues)



QuickShare

The Complete High-Speed Connectivity System for a Macintosh and a PC/XT/AT

- **Saves Time** — Uses extremely fast SCSI-based file transfer.
- **Solves Translation Problems** — Converts any PC formatted text or bit-mapped graphics to Macintosh format.
- **Convenient** — Share PC hard drives or local area networks.
- **Cost Effective** — No additional disk drives required.

Compatible Systems Corporation

P.O. Drawer 17220 • Boulder, Colorado 80308
303-444-9532 • Telex 249643

QuickShare is a TM of Compatible Systems Corp., Macintosh and Apple Talk of Apple Computer Inc

Circle 776 on reader service card

35V"/37" Monitor for the Apple Macintosh II

The Big Apple



The XC3710SS from Mitsubishi Electronics is a 35V" auto-tracking color monitor fully compatible with the Apple® Macintosh™ II. Applications for presentations, training, CAD/CAM and more. Make the move to Mitsubishi® today for all your Macintosh II needs.

Mitsubishi Electronics America, Inc., Computer Peripherals Division, 991 Knox Street, Torrance, CA 90502. Telephone: (213) 515-3993, ext. 382.

MITSUBISHI ELECTRONICS

Apple is a registered trademark of Apple Computer, Inc

Circle 642 on reader service card

THE THUNDERSCAN FACE-OFF.





WHICH SCANNED IMAGE COST NEARLY TEN TIMES MORE TO PRODUCE?

It's tough, isn't it. They both look great. But the image on the left was digitized by a scanner that costs over $2,000. The image on the right by ThunderScan.® The scanner that replaces ImageWriter's* ribbon cartridge. Just $249 complete.

Now, we'll admit, the more expensive scanners are faster than ThunderScan. But what we lack in speed, we make up for in software power. And that can actually save you time in the long run. Because with ThunderScan there's no rescanning an image to get it right.



ThunderScan saves true gray shades. So once an image is scanned, you can change it any way you want. As many times as you want. Control contrast and brightness. Create special effects. Take your image at face value or enhance it to your art's desire.



Use LaserWriter to create line screens and frames.

ThunderScan also gives you true halftones. So you can tap the full resolution of your printer. (We tapped the Linotronic® 300 for the above images, but you can use your ImageWriter™ or LaserWriter™).

Now you can plug high-resolution halftones into your PageMaker,® Quark XPress™ or ReadySetGo!™ documents. Or use your scanned images with painting and drawing software like Illustrator™ and LaserPaint.™

ThunderScan's special effects include straight line screens, rotations and frames. Plus, you get a lasso for working with irregular shaped areas. And with our new Power Port,™ ThunderScan is Macintosh™ Plus and SE compatible, right out of the box. No wonder ThunderScan was recently voted "Best Digitizer/Scanner" in *Macworld's* first annual World Class Awards.

MACWORLD WORLD CLASS AWARD 1987

So if you want a sophisticated, high-resolution scanner and like the idea of saving money, the choice is as plain as the nose on your...well, you get the picture. Now get yourself a ThunderScan.

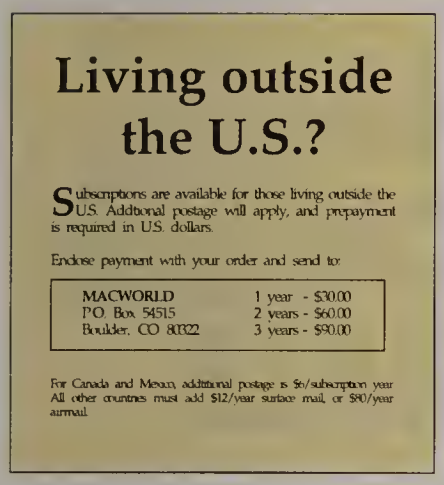
Thunderware

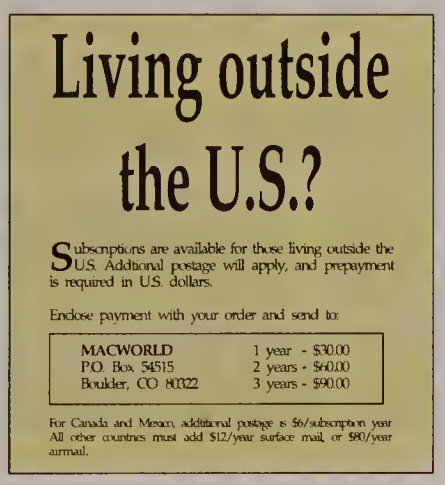
ThunderScan® FOR MACINTOSH™

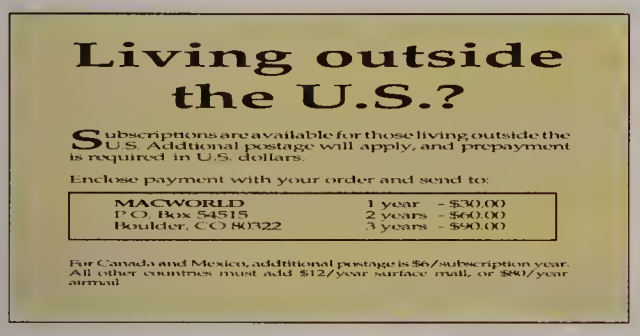
21 Orinda Way, Orinda, CA 94563 (415) 254-6581

*ImageWriter, Wide Carriage ImageWriter and ImageWriter II. Macintosh, ImageWriter and LaserWriter are trademarks of Apple Computer, Inc. PageMaker is a registered trademark of Aldus Corporation. XPress is a trademark of Quark, Inc. ReadySetGo! is a trademark of Letraset USA, Inc. Linotronic is a registered trademark of Allied Linotype Company. Illustrator is a trademark of Adobe Systems, Inc. LaserPaint is a trademark of LaserWare, Inc. © 1987 Thunderware, Inc.

Circle 176 on reader service card







The Objective Type

Tip: Creating an attractive ad headline involves custom-fitting it to the allotted space by precisely adjusting its height and width. You can set headline copy with *MacDraw* and then import it into *PageMaker* by cutting and pasting or by using *PageMaker*'s Place command. Once it's in *PageMaker,* you can stretch and pull this "graphic object" into the headline space as if it were rubber type. This strategy is OK for simple headlines, but *MacDraw*'s kerning is inadequate and its line-space control is too primitive for multiline copy. A recent upgrade of *Glue* called *SuperGlue* gives you much more effective results without forcing you to quit *PageMaker.* Set the type in *PageMaker* with automatic kerning and custom leading so that it looks better than *MacDraw* type. Then "print" using *SuperGlue* to transform the *PageMaker* text into a graphic object. Copy and paste the object back into *PageMaker* with *SuperGlue*'s SuperViewer desk accessory. You can then enlarge, shrink, widen, or narrow the entire object.

This technique works as well on a whole ad as it does on individual headlines [see "Rubber Text"].

David Zahn
Stowe, Vermont

Rubber Text

From within PageMaker, SuperGlue *lets you transform* PageMaker *headlines and text into graphics objects you can stretch or shrink to fit any space. Here an ad is shown in its original form (top left), with its headline elongated and body type the same size as original (top right), and with its entire contents stretched horizontally (bottom).*

We pay from $25 to $100 for tips published here. Send tips or questions to Quick Tips, Macworld, *501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to* Macworld*). All published submissions become the property of* Macworld. □

EZTax-PREP™

The fast, easy, accurate tax preparer for use with Lotus 1-2-3,® Symphony,® Multiplan® or Excel!®

You'll wonder how you managed without it.

It doesn't matter if tax preparation is your business or you prepare your own tax returns—EZTax-PREP with AUDIT ALERT™ will save you time and money while reducing the possibility of errors. Ideal for accountants, small CPA firms, and individuals.

EZTax-PREP has every feature you want: Fully documented/Toll-free customer support/More than 24 IRS schedules and forms/Enter data once—the system applies it to all forms and schedules/Automatic computation of new alternative tax, depreciation, alternative minimum tax/Prints IRS-approved, signature-ready returns/"What if" planning/Proven track record/Thousands of users.

EZTax-PREP costs $129.95 ($99.95 for Macintosh). Add $3.00 shipping and handling, and 6% sales tax in PA. ***Please specify computer and spreadsheet you use.***

Order now. Call toll-free.

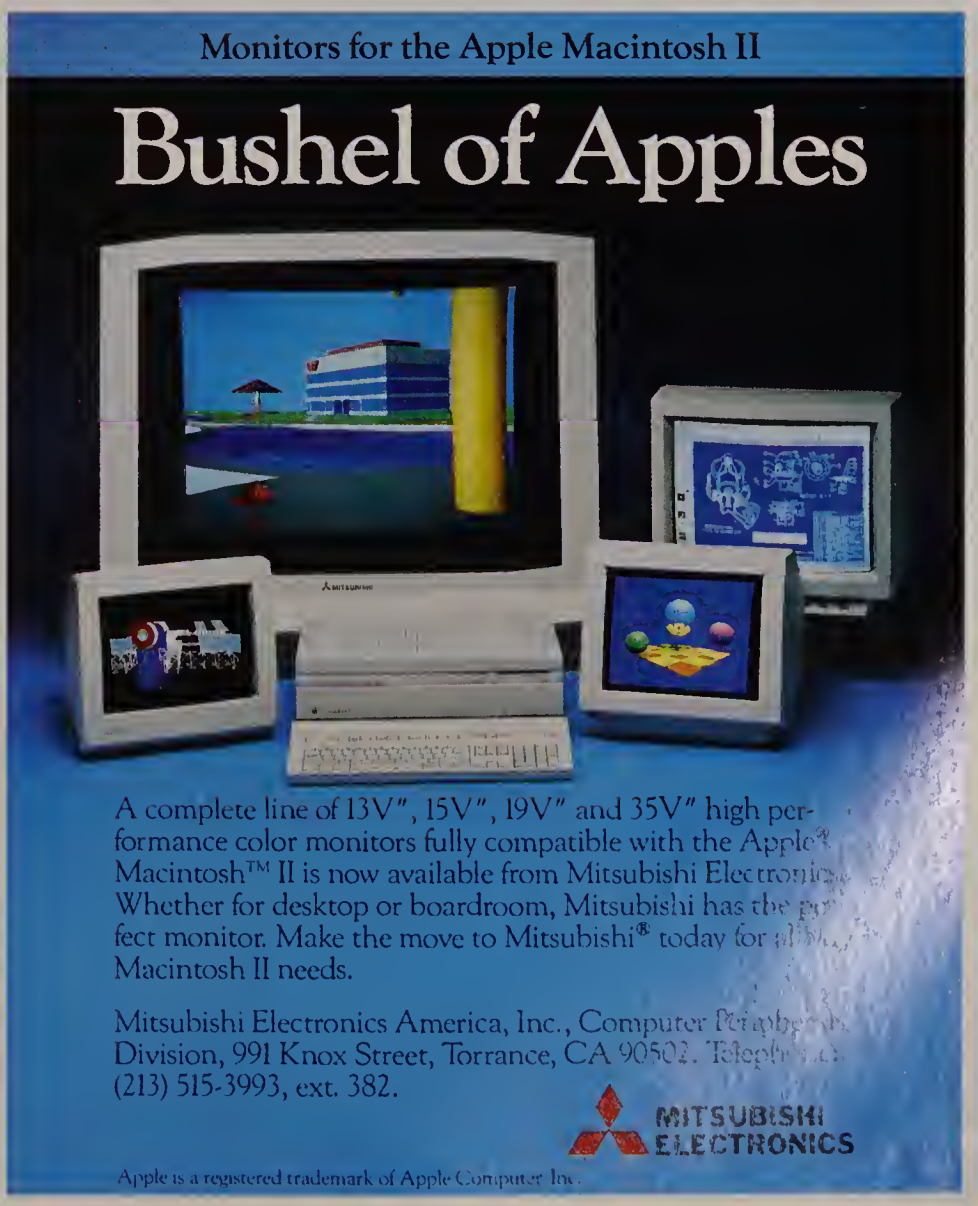
Also available:
NY, CA and PA supplements
EZTax-PREP 1065 for partnership return preparation.
EZTax-PLAN for individual or business tax planning.

EZ WARE
Dept M
29 Bala Avenue
Bala Cynwyd, PA 19004

800-543-1040
(in PA 215-667-4064)

VISA MasterCard

Circle 168 on reader service card



Circle 645 on reader service card

NOW THERE'S 3+ FOR MACINTOSH...AND ONE HALF OF CORPORATE AMERICA CAN TALK TO THE OTHER HALF.

A recent study* indicates the rapidly growing acceptance of the Macintosh by the business world.

Yet this is of little value to Corporate America if Macintosh users cannot communicate with and share the resources of existing IBM PCs, Personal System/2s and IBM PC compatibles.

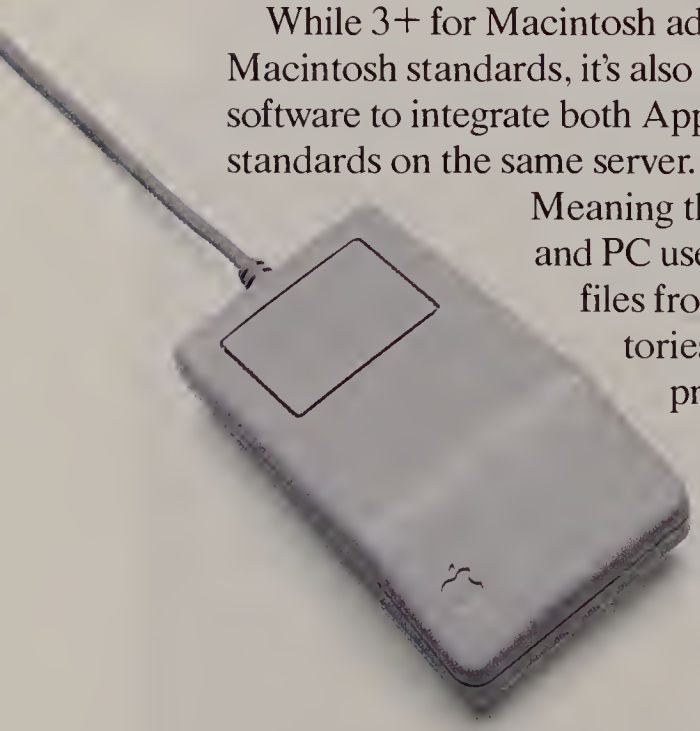
That's why—because of 3Com's continuing commitment to total networking encompassing all standards, architectures and platforms—we've developed 3+ for Macintosh.

3+ for Macintosh is part of the 3Com 3+ family of network system software, Corporate America's most comprehensive, productive and popular networking system software.

While 3+ for Macintosh adheres to the new Macintosh standards, it's also the first operating software to integrate both Apple and IBM networking standards on the same server.

Meaning that both Macintosh and PC users can share and access files from each other's directories or folders when using programs such as Lotus 1-2-3, Microsoft Word, Microsoft Excel and Aldus PageMaker.

Workgroups can communicate between networks, whether they run on Ethernet, AppleTalk or Token Ring.



Macintosh users can access files from PC users' directories.

This means they can share the resources of servers and printers and enjoy the benefit of print spooling.

And best of all, workgroup members can communicate via the most sophisticated and productive electronic mail in the networking business.

3Com 3+ electronic mail gives workgroup members communication with other distant workgroups, remote access to the network and connectivity to MCI Mail and DISOSS systems via gateways.



PC users can access and share files from Macintosh users' folders.

There is no better way for Corporate America to connect its installed base of PCs and Personal System/2s to its newly acquired Macintoshes than with 3+ for Macintosh.

Because 3+ for Macintosh is part of the 3Com 3+ family of network system software.

And there is no better network software.

For your nearest 3Com dealer, call 1-800-NET-3Com.

*PC Tech Journal (August 1987) showed that 49.7% of readers who responded to a questionnaire felt that Macintoshes would be of importance to their companies in the future.

PC MAGAZINE EDITORS' CHOICE

3Com®



© 1987 3Com Corporation. 3Com is a registered trademark and 3+ for Macintosh and 3Com 3+ are trademarks of 3Com Corporation. DISOSS is a registered trademark and IBM, Personal System 2 and PC are trademarks of International Business Machines Corporation. Macintosh is a registered trademark and AppleTalk is a trademark of Apple Computer, Inc. Microsoft Word and Microsoft Excel are trademarks of Microsoft Corporation. MCI Mail is a registered service mark of MCI Communications Corporation. Lotus 1-2-3 is a registered trademark of Lotus Development Corporation. PageMaker is a trademark of Aldus Corporation.

Circle 704 on reader service card



Getting Started with the New Mac System

Keeping up with the changing System Folder and matching the system to the Mac

by Jim Heid

My system should age as well as the Mac's. For me, the past year brought a stronger eyeglass prescription and occasional backaches–the rewards for writing by day and being a couch potato by night. For the Mac, 1987 brought new machines, faster performance, expandability, MultiFinder, and more. For the Mac at least, it was a very good year.

In *Getting Started*'s premier installment, we toured the Mac's System Folder and learned each player's purpose (see "Getting Started with the Mac System," *Macworld,* November 1986). But much has changed since the halcyon days of System 3.2 and Finder 5.3. Apple delivered two new Macs last April and has released three major system updates: System 4.0/Finder 5.4 in March, System 4.1/Finder 5.5 in May, and System Tools 5.0 in October. With its latest system release, Apple has assigned one version number to the whole package of system files. However, each file within System Tools 5.0 has retained its own version number as before (including the Finder, now 6.0). The new system files give Macs new capabilities, and the old standbys have evolved to keep up. This month, we ring in the New Year by revisiting our old acquaintance and its new contents. "System Folder Revisited" shows the icon, purpose, and latest version number of each player, as well as which version of the system Apple recommends for which Mac.

(continues)

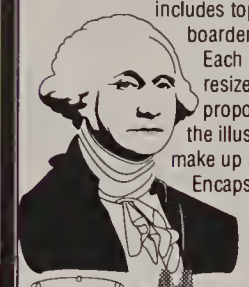


JEFFERY NEWBURY

Clip Art

Illustrations In PostScript and Encapsulated PostScript

Now you can have high quality professional illustrations for all of your graphic desk top publishing requirements. Click & Clip™ is designed and illustrated to meet your needs. Each issue includes topics of business, seasonal, sports, boarders and other timely illustrations. Each illustration can be changed by resized proportionally, distorting un-proportionally or crop any portion of the illustration when placed into page make up systems that support the Encapsulated PostScript® files. But if you want to open up the world, combine Click & Clip™ and Adobe Illustrator™ together and the change become unlimited!

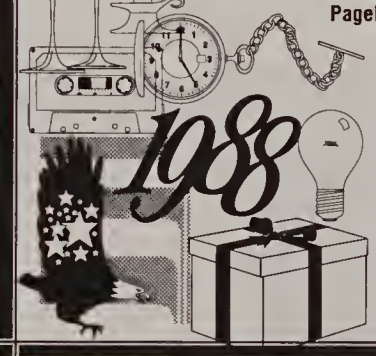


$39.95

Two Disks Packed With Very High Quality Illustrations each issue or Save even more on a complete Year!

Quality, speed & creativity is now placed at your finger tips. With out put by every PostScript®-equipped printer.

Ask About our special Click & Clip™ and Adobe Illustrator® or Aldus PageMaker® Special package offer!



Order Today by sending:$39.95 for one issue,$67:00 for 2 issues or $124.50 for four issues (Full Year) along with you Name, Address, City, State, Zip and Phone # to: Studio Advertising Art, P.O. Box 18432-52, Las Vegas, NV 89114

Phone Orders Only Call (800)235-6646 ext.227; in Calif. (800)235-6647 ext. 227

Technical Support (702)641-7041 9am-4pmP.S.TIME

Circle 703 on reader service card

Even at 15,000* pages a minute, nothing can escape the phenomenol searching capabilities of the SONAR™ Text Retrieval System.

SONAR™ Text Retrieval System

- ◊ Search the contents of one document, or thousands at a time, for a particular word or phrase.
- ◊ Works with popular word processor text files: Word™, MacWrite™, WriteNow™, MORE™, Trapeze®, and text only.
- ◊ Excerpts and notes can be appended to the clipboard.
- ◊ An annotated listing of all paragraphs selected by a search can be printed or saved to disk.

* on a Macintosh™ II. Timings may vary depending on size of documents and type of computer.

- ◊ Powerful indexing capabilities.
- ◊ Supports boolean, proximity, and wildcard searching: ('J* Doe' AND 'Mary Smith') ('John' within 5 words of 'Doe').
- ◊ Analysis capabilities can find relationships between people, places, and things.

SONAR There is NO hiding.

Virginia Systems Software Services, Inc.

5509 West Bay Ct.
Midlothian, VA 23113

(804) 739-3200

Come see us at the MacWorld Expo in S.F. (Booth 1831)

Circle 70 on reader service card

An Expanding World

The System Folder owes its progress to three catalysts: last April's unveiling of the Macintosh SE and Mac II, the March christening of the *AppleShare* networking software, and the October release of MultiFinder. The new Macs marked the shift toward hardware expandability but in the process introduced compatibility challenges. *AppleShare*'s ability to share a hard disk over a network required changes in the Finder. MultiFinder's approach to running multiple programs required changes in many files and brought with it an appetite for memory that has many people fuming on their way to buy upgrades.

But few would complain about the debut of expandable Macs. The SE's single system expansion slot and the Mac II's six Nubus slots let those machines house boards for color displays, IBM PC compatibility, increased speed, networking, and more. However, the birth of expandable Macs presented Apple with a challenge: maintaining software compatibility for all models, regardless of what expansion options they may hold. In the IBM PC world, users must often run software *installation* programs to tell other programs what kind of hardware they're using. To avoid imposing that chore on Macintosh users, Apple took the system files in a new direction: toward modularity.

The best place to see the modular approach is the Control Panel (accessed through the Apple menu) in System versions 4.0 and higher (see "The Old and the New"). Along its left side the Control Panel now boasts a row of icons, each corresponding to an *extension* that lets you set options for a particular device. The extension called General is used for the same basic settings the old Control Panel handled–the time, date, speaker volume, and so on. The Mouse and Keyboard extensions govern the mouse pointer's speed and the keyboard repeat rate. Mac SE and II users with more than one SCSI hard disk can use the Startup Device extension to tell the Mac which one to use when starting up. And Mac II owners can use the Color, Monitors, and Sound extensions to choose colors and adjust monitor settings, to specify the interaction between multiple monitors attached to one machine (for example, which windows should appear on

(continues)

System Folder Revisited

File Name	Purpose	Current Version
System Files		
Finder	Disk, program management	6.0, 4.2 for 128K Macs, 5.3 for 512K Macs
MultiFinder	Runs multiple programs simultaneously	1.0
System	Holds fonts, desk accessories, operating system	4.2, 2.0 for 128K Macs, 3.2 for 512K Macs
Scrapbook File	Holds contents of Scrapbook	2.3
Note Pad File	Holds contents of Note Pad	n/a
Clipboard File	Provides auxiliary storage for Clipboard data	4.2
MiniFinder	Switches quickly between programs (w/o MultiFinder)	1.0*
Backgrounder	Lets printing take place in the background	1.0
Macintalk	Lets applications generate speech	n/a
DA Handler	Runs desk accessories under MultiFinder	1.0
Printer Resources		
ImageWriter	Allows printing to ImageWriters	2.6
LaserPrep	Prepares PostScript printers for printing	5.0
LaserWriter	Allows printing to PostScript printers	5.0
AppleTalk ImageWriter	Prints to AppleTalk-equipped ImageWriter II	2.6
PrintMonitor	Print spooler for PostScript printers	1.0
Control Panel		
Startup Device	Selects start-up disk (SE or II)	3.2
Monitors	Selects display options on Mac II	3.2
Mouse	Adjusts mouse tracking and double-click speed	3.2
Keyboard	Adjusts key repeat rate and delay	3.2
General	Provides basic Control Panel settings	3.2
Sound	Selects system beepsounds (Mac II)	3.2
Color	Displays selected test or icon in color	3.2
Other Files		
Key Layout	Provides keyboard layout for Key Caps	2.2
Easy Access	Lets multikey combinations be entered key by key, and allows pointer movement with numeric keypad	1.0
Finder Startup	Automatically starts up selected programs	n/a
Startupscreen	Replaces "Welcome to Macintosh" start-up message	n/a

*available in System 4.1 and earlier versions



Put the NFL at your fingertips.

Hands-on pro football excitement is as close as your keyboard with **NFL Challenge** from XOR. This exciting, action-packed computer game gives you updatable rosters of all 28 NFL teams, offensive and defensive playbooks, and true-to-life realism with penalties, injuries, substitutions, and more!

Operating on the IBM PC, PC-XT,PC-AT, and their compatibles as well as the Apple Macintosh, **NFL Challenge** puts you at the heart of the action as you select the starting lineups, drive downfield against the clock, and go head-to-head against the league's most innovative offenses and formidable defenses.

Kick off your home season with this software classic now at your local computer store. Or call **1-800-NFL-CHAL** TOLL FREE. Be sure to check out **PRO Challenge,™ Basketball Challenge,™ Oligopoly,™** and **Bermuda Square,™** examples of some other First Class Software from XOR.

Officially Licensed Product

XOR™ CORPORATION
5421 Opportunity Court
Minnetonka, Minnesota 55343
(612) 938-0005

Circle 146 on reader service card

10 Megabytes / 10 Minutes

FASTBACK*

For The Macintosh

Backup software for your hard disk.



THE FASTEST.

NOW AVAILABLE FOR THE MACINTOSH

If your backup program isn't fast, you won't use it. Fastback for the Macintosh is the **only** program that can copy a full 10-Megabyte hard drive to standard floppy disks in less than 10 minutes! The minutes you save with Fastback may add up to **hours** compared to other backup programs.

Fastback is also the only program that uses advanced **error correction** techniques to recover data from damaged backup disks. And Fastback is **powerful** -- you can backup all your files, select folders and files for backup, or have Fastback select only the files which have changed. Fastback will even count up the disks you need and **print labels** for them.

Protect the data on your hard disk now. Remember, among those who use hard disks on their Macintosh systems, there will only be two types -- those who use Fastback, and those who wish they had! See your dealer today and ask for Fastback from Fifth Generation Systems, the leader in disk backup software.

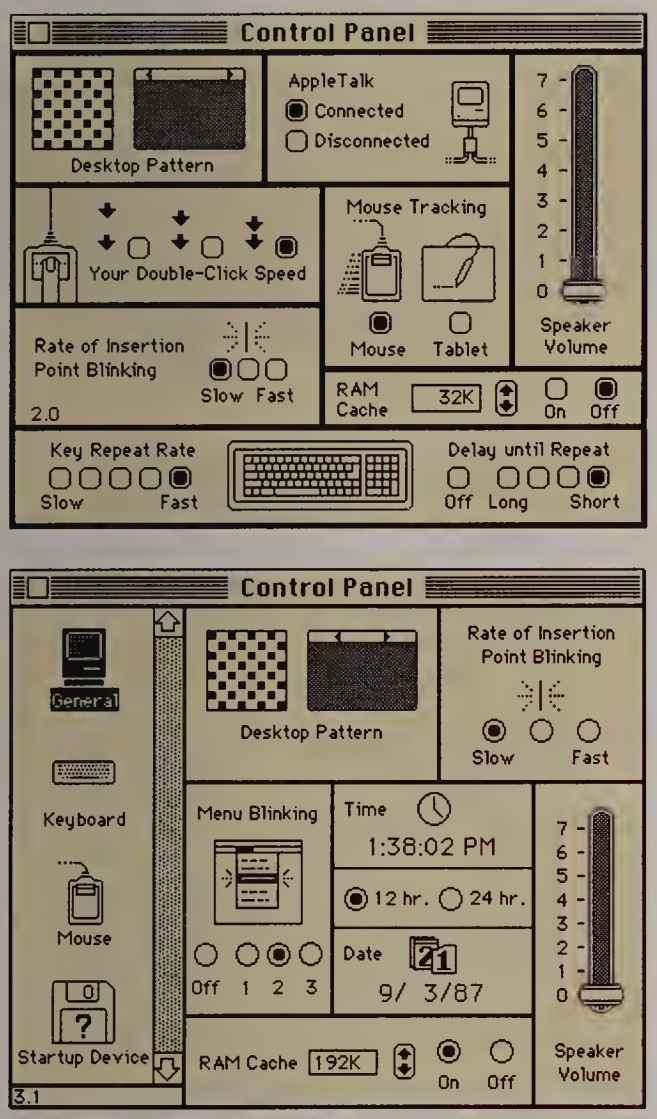
Fifth Generation
SYSTEMS, INC.
11200 Industriplex Blvd.
Baton Rouge, LA 70809

Sales Office: 1322 Bell Ave.
Suite 1A, Tustin, CA 92684
(800) 225-2775 (714) 259-0541

See Us At Macworld Expo, Booth: 430

Circle 312 on reader service card

*This is in no way associated with or has origination in Fisher Scientific or Allied Corporation. Macintosh is a trademark of Apple Computer, Inc.



The Old and the New
In System versions 4.0 and later (bottom), the Control Panel uses cdev resources; each cdev controls a different aspect of the Mac's operation. When you open the Control Panel, it displays along its left edge any cdevs it finds in the System Folder. (Tip: to see who programmed the Control Panel, click on the version number below the icon list.) At top, the nonmodular Control Panel of System 3.2. The controls for AppleTalk have moved to the Chooser, while those for the keyboard and mouse are now in their own cdevs.

which screens), and to choose a digitized sound to replace the standard system beep.

Each extension is actually a separate System file called a *cdev* (pronounced *see-dev*), short for *Control Panel device.* When you open the Control Panel, it looks for cdevs, then displays the icon for each one it finds. Click on an icon, and the cdev swings into action, adding to the Control Panel's window whatever buttons and options are necessary for the device you chose. Thanks to cdevs, Mac II and SE users don't have to run cantankerous installation programs to add new hardware to their machines. Instead, users simply copy into the System Folder any cdevs that accompany the new add-ons and use the Control Panel to set up the new hardware.

Cdevs have other uses, too. A Mac II software package called *Colorizer* (Palomar Software, 619/727-3922) includes a cdev for adding color to menus, windows, and other on-screen objects. *QuicKeys* (CE Software, 515/224-1995) is a slick cdev that lets you add keyboard shortcuts to menu commands and type out lengthy text passages or even run applications with a single keystroke. Some free cdevs are available in the public domain through user groups and online services. One called *Cache II,* by Jan Eugenides, lets Mac II users improve compatibility by disabling the 68020's instruction cache, which can cause some pre-Mac II programs to crash. And for fun, try Mark Bennett's *Cheap-Beep,* which lets Mac Plus and SE users replace the standard system beep with digitized sounds, including *Star Trek*'s Dr. McCoy barking, "Are you out of your Vulcan mind?"

Apple is also encouraging application developers to use cdevs to add "preferences" features to their programs. With this approach, instead of choosing a Preferences command to specify your favorite working options, you would open the Control Panel and click the application's cdev. At this writing, no developers are using cdevs in this way, but several I've spoken with say they plan to.

DAs and Menus within Menus

Another example of the modular approach is the improved Key Caps desk accessory. Key Caps now requires a new system file called Key Layout, which contains the resource information Key Caps needs to replicate the keyboard layout for the Mac's four possible keyboards—the original, the Mac Plus keyboard, and the 81-key or 105-key Apple Desktop Bus keyboards for the SE and II. Key Caps also has a menu that lets you change the font in which the keyboard layout appears, a useful feature for locating characters in pictorial or symbol fonts.

Speaking of desk accessories (commonly known as DAs), today's system files also boast an improved Chooser, the DA you use to select printers and network file servers. Previous Choosers could display icons for only six devices, which might not be enough for a large AppleTalk network with many printers and file servers. Since the new Chooser lets you scroll through

(continues)



You call the shots with Basketball Challenge™

Not only can you call the shots, but you can also set the offense, select the defensive set, determine the tempo for the game, and make substitutions in this real time, five-on-five college basketball simulation game from XOR Corporation.

Select from 20 teams, add your coaching ability, and see how many victories you can chalk up in your win column. Operating on the IBM PC, PC-XT, PC-AT, and their compatibles as well as the Apple Macintosh, **Basketball Challenge** puts you at the heart of the action with the pressures and tensions of real life coaching situations.

Pick up your copy of **Basketball Challenge** at your local computer store today. Or call **1-800-635-2425** TOLL FREE. And be sure to check out **NFL Challenge,® PRO Challenge,™ Oligopoly,™** and **Bermuda Square,™** examples of some other First Class Software from XOR.

XOR™
CORPORATION
5421 Opportunity Court
Minnetonka, Minnesota 55343
(612) 938-0005

Circle 265 on reader service card



MAX YOUR MAC™

WITH

bede tech™

CALL TO ORDER

800-772-4536

IN OHIO 216-631-4214



RIBBON INKERS

Pay Only $49 For A Lifetime Ribbon Supply!
Don't throw away used ribbons when you only use up the ink. Bede Tech inkers re-ink ribbons over and over for just pennies each time! Print quality surpasses new ribbons – and gets better with each re-inking.

FREE 4-oz. bottle of black ink lasts 50-100 re-inkings. FREE Ink Roller & Roller Cover

Inker Kit for ImageWriter Printers
Reg. $67 Value **$49.00**

Inker Kit for Epson Printers
Reg. $71.50 Value **$52.95**

INK AND RIBBONS

Black Ink, 4 oz. bottle	**$4.50**
Black Ink, Pint	**$16.50**
ImageWriter Ribbons, Uninked	**2/10.00**
ImageWriter Ribbons, Inked	**2/12.00**
Colored Ink, Multi-Color Ribbons	**Call**



KEYBOARD COVERS

Protect keyboards from spills and dust.

MAC and MAC PLUS Beige Hard Covers

NEW MAC SE and MAC II Platinum Hard Covers

Specify standard or extended keyboards.

Bede Tech Bonus. Mac Keyboard Command Reference Charts printed inside each cover. Reg. $17.50 Value

BEDE TECH DIRECT $9.95

HARD-TO-FIND MAC BATTERY

Inside the Mac and Mac Plus is a 4.5 volt battery that lasts about two years. Replace it before it dies or leaks inside your Mac. Reg. $4.75 Value.

BEDE TECH DIRECT $3.95

Circle 490 on reader service card

MOUSE PAD

Royal blue anti-static surface
9⅜" x 7⅞". Call for additional colors.
Reg. $9.95 value.

BEDE TECH DIRECT $5.95

- ***24 Hour Shipment***
- ***30 Day Money-Back Guarantee***
- ***Free Catalog with Order***

Prices subject to change without notice.

ITEM	QTY	PRICE	TOTAL
_____	_____	$ _____	$ _____
_____	_____	$ _____	$ _____
_____	_____	$ _____	$ _____
_____	_____	$ _____	$ _____
_____	_____	$ _____	$ _____

Shipping & Handling $ **2.00**
Canada, Hawaii, Alaska, C.O.D., S&H $4.50 _____
7% Sales Tax (Ohio Residents Only) _____
TOTAL ORDER $ _____

☐ Check ☐ Money Order ☐ C.O.D.
☐ MasterCard ☐ Visa Exp Date _____

Card No. _____
Signature _____
NAME _____
COMPANY _____
STREET _____
CITY _____
STATE _____ **ZIP** _____
DAY PHONE (_____) _____

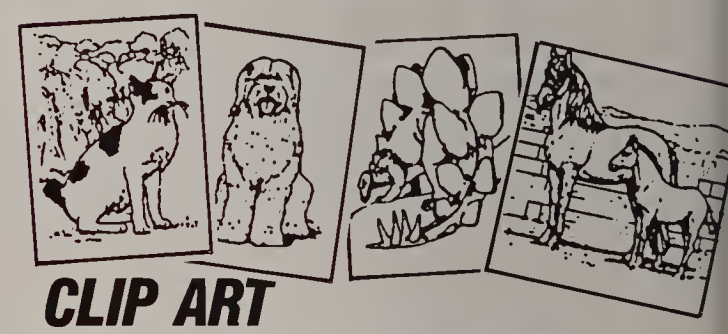
bede tech™
Division, Bede Industries, Inc. Est 1976
8327 Clinton Road • Cleveland, OH 44144

ImageWriter is a trademark of, and Macintosh is a trademark licensed to Apple Computer, Inc.
©1987 Bede Tech.

NEW DISK ORGANIZERS

Specify White or New Wood-Grained style.
Save time and space when you store up to 50 or 100 disks in our stacking Disk Organizers. Sturdy 200 lb. test E-flute cdb., dividers, lid.

3.5" DISK ORGANIZER	**$7.45**
Holds 100 disks	**4/$24.95**
3.5" DESK TOP DISK ORGANIZER	**$4.45**
Holds 50 disks	**4/$14.95**
5¼" FLOPPY DISK ORGANIZER	**$5.45**
Holds 100 disks	**4/$19.95**
COMPACT DISK ORGANIZER	**$3.95**
Holds 50 C.D.s	**4/$13.95**



CLIP ART

Bede Tech has digitized popular animal and plant illustrations to the Mac Paint format. You can use Mac Paint to modify these public domain illustrations. Or create your own fanciful creatures! Bede Tech Software is not copy protected.

Bede Tech Clip Art prints big, full page black and white illustrations 8½" x 11". Ideal for your business, school or organization. Or print in color with ImageWriter II.

The large size printout also makes Bede Tech Clip Art ideal for children to color with crayons and markers. Fun! Educational! Useful!

- ***VOL I*** Dinosaurs, Dogs, Cats, Horses
- ***VOL II*** Dinosaurs, Dogs, Cats, Horses
- NEW ***VOL III*** Tropical Fish, Tropical Birds, Tropical Plants, Wild Flowers
- NEW ***VOL IV*** More Dinosaurs, Small Animals, Oceanic Fish, Birds of America

BEDE TECH DIRECT $12.95 each

BEDE TECH BONUS
• FOURPAK VOL. 1-IV $39.95

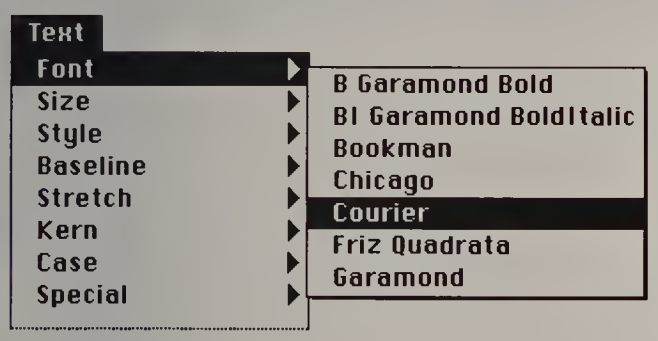
NEW ***CHRISTMAS CLIP ART $8.95***

Great Gift!
Order Several!
Limited Time Offer.



the entire icon list, you can now access as many devices as your network has.

A significant enhancement that debuted in System 4.1 is the ability to create *hierarchical menus*—menus within menus that appear when you drag down to the hierarchical menu's title and pause (see "A Menu's Menu"). Hierarchical menus give programmers more places to cram options without having to create gargantuan dialog boxes. A hierarchical menu can even contain its own hierarchical menus—like small boxes hidden within a larger one.



A Menu's Menu

System versions 4.1 and higher contain revised Menu Managers that can create hierarchical menus—menus within menus that appear when you drag to a hierarchical menu title and pause briefly. Shown here are the Text and Font menus from Target Software's Scoop *desktop publishing program, one of the first applications to use the new menus.*

Finding Common Ground

Besides new system files, each new generation of Mac has brought revised read-only memory (ROM) chips, whose software resides permanently in the Mac and creates menus, windows, and most other aspects of the Mac's personality. The 128K and 512K Macs contained 64K of ROM. The Mac Plus and the 512K Enhanced doubled that amount to 128K, and the SE and the II doubled it again, to 256K. Besides containing twice the software as the previous generation, each revision brings faster performance and more features. For example, the Hierarchical File System (HFS), which provides folders for efficient hard-disk management, debuted in the 128K ROM of the Mac Plus and 512K Enhanced. The Mac II ROM contains software for producing color displays and managing expansion slots. Both the SE and II ROMs house improved text-editing routines; they also hold fonts that used to reside in the System file on earlier Macs.

But the problem with hot-rodding ROMs is that older machines might get left out in the cold, unable to run programs that require routines in the new ROMs. Apple's solution was to establish some common ground—a set of features and capabilities that developers could assume would be present in each generation of the system.

An Apple utility called Installer (included with the new system disks) creates this common ground. When you start Installer, you'll see a list of *scripts*—each tailored to a specific Macintosh model. Just choose the script you need, aim the Installer at a system disk, and you've brought that System Folder up to date. During the updating process, Installer *patches* the disk's System file, a job that involves adding the system routines necessary to create the common ground. When you start up an older Mac with a system disk that was updated for it, those routines (which are in ROM on the new machines) are loaded into an area of the Mac's memory called the *system heap.* That reduces the amount of free memory available, but enough remains to run most programs. The benefit is that, despite four years of evolution, the Macintosh family remains remarkably compatible.

But not completely compatible. The 128K ROMs do so much more than their 64K ancestors that patching all the needed routines into memory would leave little room for running programs. For that reason (and because of the Mac Plus's popularity), many software developers are abandoning 64K ROMs and crafting their wares for machines having 128K or larger ROMs—in other words, for the Mac Plus and its descendants. If you have a 128K or an unenhanced 512K Mac, it's time to consider upgrading if you want to run the latest programs.

Lost in Finders

Indeed, you'll *have* to upgrade to at least a 512K Enhanced to run the latest system software, System Tools 5.0, and

(continues)



Win $5,000 with Bermuda Square™

Solve the Bermuda Square puzzle and you could win $5,000 from XOR. If you're the one who can fit the 24 different sized squares into the one larger square, you could be the winner.*

Based on this mathematical formula of $1^2 + 2^2 + 3^2 + \ldots + 24^2 = 70^2$, it's the puzzle of the century. Operating on your IBM PC, PC-XT, PC-AT, or their compatibles as well as the Apple Macintosh, **Bermuda Square** brings you hours of puzzle-solving fun.

Pick up your copy of **Bermuda Square** at your local computer store today. Or call **1-800-635-2425** TOLL FREE. And be sure to check out **NFL Challenge,® PRO Challenge,™ Basketball Challenge,™** and **Oligopoly,™** examples of some other First Class Software from XOR.

* Write XOR Corporation for complete contest rules.

XOR™ CORPORATION
5421 Opportunity Court
Minnetonka, Minnesota 55343
(612) 938-0005

Circle 68 on reader service card

Expandability, flexibility, productivity, and the ability to soar.



There's a lot of new and exciting products in the Macintosh market these days. And DOVE has been leading the way in developing quality product solutions. Products designed to take you to new heights of productivity and performance.

That leadership role continues as DOVE prepares to soar into 1988 with an expanded MacSnap™ product line. In addition to our memory offerings for the entire Macintosh family of computers, DOVE will now bring you video, accelerator and graphics products. Of course these new products reflect the reliability and state of the art engineering you've come to depend on from DOVE.

Call us toll free at 1-800-622-7627 to stay on top of your productivity needs.

DOVE
COMPUTER
CORPORATION

1200 North 23rd Street • Wilmington, North Carolina 28405
919-763-7918

Circle 498 on reader service card

you'll need the full Mac Plus upgrade to run MultiFinder. MultiFinder represents the Mac's first, wobbly steps toward *multitasking*—which enables you to run multiple programs simultaneously or work in applications while the computer performs time-consuming tasks, like printing or telecommunications, in the background (see "MultiFinder: The Application Juggler," *Macworld,* October 1987.) But because of the extra system software required to keep multiple programs from bickering over each other's bytes, MultiFinder craves memory like I do DoveBars. If you're upgrading to a Plus and you want to use MultiFinder to work with multiple applications, you'll need at least a second megabyte of RAM (random access memory—the temporary workspace in which applications run)

I usually perform only one task at a time, and I enjoy taking a break while my Mac and printer converse, so MultiFinder is of little use to me. But its cohort, Finder 6.0, does have a place in my System Folder. Finder 6.0 is the third Finder to appear this year. The first, Finder 5.4, was released along with Apple's *AppleShare* file-server software, which lets members of an AppleTalk network share hard disks attached to a Mac Plus or another 1MB Mac (see "AppleShare: Multifaceted Networking," *Macworld,* March 1987, and "Getting Started with Networking," *Macworld,* September 1987).

When *AppleShare* is running, Finder 5.4 and its descendants recognize it and add a Get Privileges command to their File menus, which lets network members specify how their own files and folders can be accessed by others. The new Finder's disk windows also reflect the network's design, with icons showing who can open and modify folders. By making the Finder "*AppleShare* aware," Apple created a networking product that blends into the Mac environment better than any other.

The Finder's other improvements range from cosmetic to convenient. The Trash Can bulges when it contains something. Two Get Info windows can appear side by side, which is handy when you're comparing two files to see which is the most current. A Restart command debuted in the Special menu, and the workings of the Shut Down command changed. Shut Down now uses a new system routine called the Shutdown Manager. On a Mac II, the Shutdown Manager turns off the computer. On other Macs, it displays a dialog box that gives you the option of shutting off the Mac or restarting it. The Clean Up command has some new permutations that let you selectively clean up icons. And a slick shortcut appeared: press the Option key while dragging a file into a different folder and the Finder puts a copy of that file in the folder, rather than moving the original.

Finder 6.0 shares these refinements and adds its own. The dialog box that appears when you copy files contains a Cancel button and conveys more information, showing which file is currently being read or written, while a little bar graph shows the Finder's progress as it copies multiple files. The About the Finder command shows how much memory is available; when MultiFinder is running, you'll also see how much memory is consumed by each open application. On Mac IIs, a Color menu lets you choose a color for an icon or a folder. The Set Startup command now lets you specify whether to use MultiFinder, and if so, whether it should open any applications upon start-up.

More Power to the Printer

The printer drivers have been remodeled too. The 4.0 versions of the PostScript printer drivers, LaserWriter and LaserPrep, were roughly twice as fast as their version 3.0 counterparts, and they offered several new options. You can specify that a page be flipped vertically or horizontally, or inverted (black becomes white, and vice versa). These options work especially well with Linotronic PostScript typesetters. By loading the typesetter with film instead of the more commonly used opaque photographic paper, you can create the film negatives and "wrong-reading" images (which appear backwards when viewed from the light-sensitive side of the film) that many printers require.

Another LaserWriter print option, Larger Print Area, lets you print closer to the edges of a page by stealing printer memory usually reserved for holding downloadable fonts. Finally, there's an op-

(continues)



ALL-PRO tackles with PRO Challenge™

Put yourself on the 50 yard line with **PRO Challenge** from XOR. While at the console of your IBM PC, PC-XT, PC-AT, or their compatibles as well as the Apple Macintosh, you send in the plays that will make your team a winner as you battle for victory in this fast-paced game.

Starting with two all-NFL teams of equal strength, you choose from 27 offensive and 14 defensive plays to outwit your opponent or the computer in this action-packed game. Fumbles, interceptions, and penalties add to the true-to-life simulation.

Reserve your spot on the sidelines with **PRO Challenge** from your local computer store. Or call **1-800-635-2425** TOLL FREE. Be sure to check out **NFL Challenge®**, **Basketball Challenge™**, **Oligopoly™** and **Bermuda Square™**, examples of some other First Class Software from XOR.

Officially Licensed Product

XOR™ CORPORATION
5421 Opportunity Court
Minnetonka, Minnesota 55343
(612) 938-0005

Circle 110 on reader service card

Would you buy a big screen with your eyes closed?

In 1986, there was one dual-page display for the Macintosh™ computer: ours. The choice was simple. Now, it seems, everybody and his dog makes one. So it gets confusing when you're shopping. To make matters worse, there are very few places you can sit down and compare big screen displays.

But you don't have to buy "blind." Our MegaScreen™ gives you advantages we can demonstrate here.

WYSIWYW (What You See Is What You Want).™

Other big screens give you a compressed display, showing 82 or even 94 dots per inch (d.p.i.). That means 10-point type looks like 7-point type. It's just too small to read comfortably. MegaScreen lets you select screen resolutions. For example, when you work with graphics, you'll want accurate proportions. Our 75 x 75 d.p.i. resolution displays sizes and shapes perfectly. When you work with a big spreadsheet, select maximum resolution: 75 x 87 d.p.i. (1024 x 900) and get even more data on the screen. You control it all with a menu.

There are one and two-page MegaScreens for the Macintosh SE and Macintosh II. Interface cards are dealer-installed —typically in less than 10 minutes— without voiding the Apple® warranty. MegaScreens are also available for the Macintosh Plus.

There is a big difference between big screens.

75 x 75 d.p.i.	Laser Output	82 x 82 d.p.i.

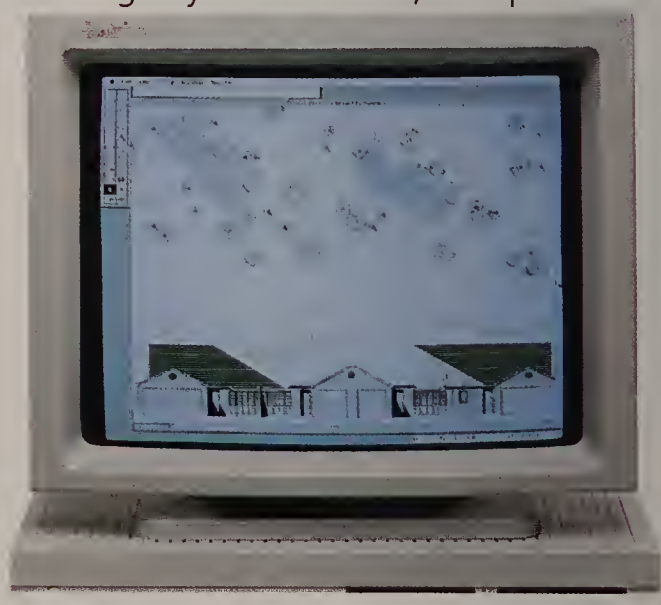
If you want your big screen to show accurately what will be printed, you need our 75 x 75 d.p.i. resolution.

We remember the future.

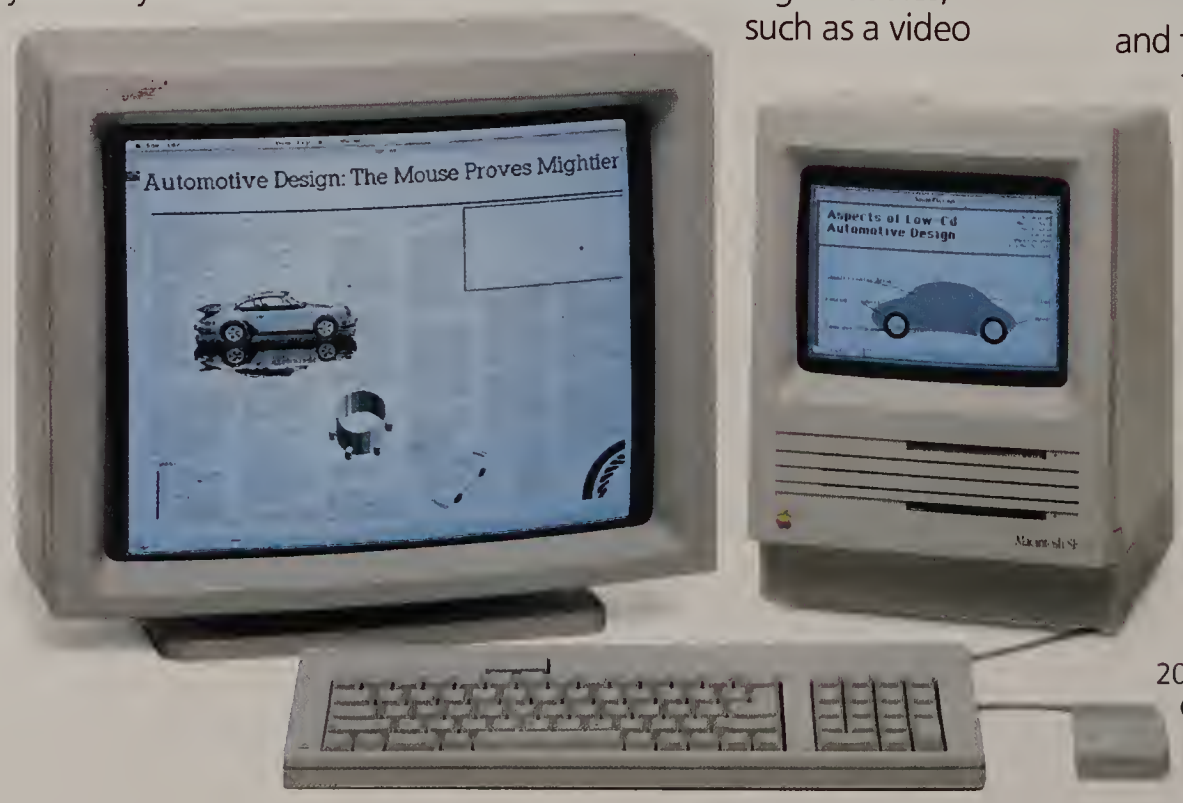
With an SE, we know you're giving up your slot by adding an interface card, so we've provided options. You can choose a card with a 68881 math co-processor, or you can select our modular card, which provides its own 'slot' for our MegaModules, such as a video output (NTSC, PAL, and standard Macintosh signal).

Unlike some big screens, we even give you options for your original Macintosh screen: it can work in tandem with your MegaScreen to extend your work space. Or, if that's not useful to you, we have something that will be: it's called MegaTalk. It's included in our Video System and lets you communicate with one or more users through your AppleTalk® network. Even while running other applications.

Someday, other big screens may give you the control, the options and the additional communications features MegaScreen Video Systems offer.



MegaScreen 2001 lets you display 300% more data than the Macintosh II monitor.



But if you need the increased productivity today, you can clearly see there's only one choice.

M · E · G · A Graphics

We Have Seen the Future.

20954 Osborne St., Canoga Park, CA 91304
Call us at (818) 407-0571 for your dealer.
Telex: 650-0349 MCIMAIL

All screens shown are unretouched photographs of running displays. This ad and the desktop publishing example were created with Quark XPress.™ The CAD document was created with Versacad™ MegaScreen, MegaTalk and WYSIWYW (What You See Is What You Want) are Trademarks of MegaGraphics, Inc. Apple and AppleTalk are Registered Trademarks and Macintosh is a Trademark of Apple Computer, Inc. Versacad is a Registered Trademark of Versacad Corp. Quark and XPress are Trademarks of Quark Incorporated. MegaGraphics is an Authorized Value Added Reseller of Apple Computer Inc. ©1987, MegaGraphics, Inc.

Circle 609 on reader service card

tion that eliminates the slight distortion that often plagues printed bit-mapped (*MacPaint*-type) graphics because their 72-dot-per-inch (dpi) resolution isn't an even multiple of the LaserWriter's 300 dpi. To resolve this problem, the Precision Bit-map Alignment option reduces the entire page by 4 percent. The latest PostScript drivers, versions 5.0, provide these same niceties and work with MultiFinder as well, so you can issue a Print command and then jump into another job while the drivers get the printer going in the background.

The past year also saw new versions of the ImageWriter drivers that offer improved print quality in the Best mode and also fix miscellaneous bugs. And a new print driver, ImageWriter LQ, is shipping with the ImageWriter LQ printer.

Odds and Ends

Other enhancements to the System Folder may not be as significant as MultiFinder, but they're noteworthy nonetheless. Easy Access is an Init file that provides two keyboard-modification features. (Init files contain small system-modifying routines that the Mac executes upon start-up. For a more detailed explanation of Inits, see "Getting Started with Desk Accessories," *Macworld,* October 1987.) One called Sticky Keys, which makes the keyboard more accessible for the handicapped, goes to work when you press the Shift key five times. When Sticky Keys is active, you can use combination keystrokes (such as ⌘-S, or Shift-Option-[) without having to press two or more keys simultaneously. Instead, you press one after another: first the modifier key or keys (⌘, Option, Shift, Control), then the character key. Easy Access's other feature, obtained by pressing ⌘-Shift-Clear, is called Mouse Keys. It lets you move the pointer using the keyboard's numeric keypad (see "The Pointer's Keys"). It not only makes single-pixel positioning a cinch, it could be a godsend if your mouse dies while you're on deadline.

It should be obvious that updating your System Folder is the least expensive way to improve your Mac. The latest system software is available free from user groups, online services, and Apple dealers. (If you

(continues)

Suitcase ⌘K
Abacus
Acta
Alarm Clock
Analog Clock
AppleFont
Area Code Lookup
ASLTalk
Backdrop
Base Tool
BCS*Clicker
Big Ben
Calculator+
Calendar
CalendarBook
Camera
Charger
Chooser
Comments
Control Panel
Cube
DAFont
DiskInfo
DiskTools II
DiskTop
Display Message
Explorer
File Tools
FileInfo
FileStar
Find File
Fix Pic
FreeMem
Fun House
Function Keys
Gone Fishin'
Grep-Wc
Guidance
HDMount
HDValet
Hex Calc
Idle
JumpStart Log
Key Caps
KeyMouse
Laser Envelope
LaserStatus
LifeSaver
LockOUT
Mac's Headroom
Mac Clock
MacDialer
MacTerm
Magnify
Magnifying Glass
MathType
MCS Editor+
McSink
Memory
Memory Monitor
Mini Sci Calc
MiniWAITEA
MockWrite
Moire Idle
Mouse Print
Notepad
NotePad+
ParmBlaster
Phone Pad
Poly Idle
Print Text
PS Printer
Q&D Editor
Q&D Filer
QDial
QuickSheets
RasNIH
Rays
ReadiPrinter
ReadMacWrite
RPN Calculator
Savior
Sci Calculator

Free at last.

The liberation of fonts and desk accessories is now at hand. Suitcase™ allows unlimited access to fonts and DAs—and they don't have to be installed in your System file.

Imagine having fifty or more of your favorite DAs in your Apple menu. Or, if you're involved in desktop publishing, how about three hundred or more fonts at the ready?

Having unlimited access to every font and DA means always having the right tool at your disposal.

Now that's freedom.

SUITCASE™
Font and Desk Accessory Liberation

Compatible with MultiFinder.
Suggested retail price $59.95.
Order from your favorite software retailer or call **(800) 443-0100, ext. 451.**
This number is for credit card orders **only.**
$3.50 shipping/handling charge per order.

software supply
599 N. Mathilda Ave.
Sunnyvale, CA 94086
(408) 749-9311

The desk accessory (DA) and font names above, some of which are trademarks owned by parties not affiliated with Software Supply, are illustrative of usage only and do not imply that the DAs or fonts themselves are part of the Suitcase™ product.

Font
Abu Dhabi
Aldous
Alice
Apple I
Arabic
Art Deco
Athens
Avant Garde
Avant Garde Gothic
Basel
Bodoni
Bodoni Ultra
Bookman
Boston
Bubbles
Camelot
Cairo
Candy
Carta
Cartoon
Cavanaugh
Centura
Century Old Style
Cheltenham
Chicago
Circus
Cirth
Clinton
Cooper Black
Coptic
Courier
Coventry
Cream
Cursive
Dali
Demographics
Demotic
Elvish
Eon
Epsilon
Fancy Caps
Fargo
Finney
Fletcher
Franklin Gothic
Galliard
Garamond
Gatsby Light
Geneva
Glypha
Goudy Old Style
Hamburg
Helvetica
Helvetica Light
Hollywood
Houston
Korinna
LED
Letter Gothic
London
Los Angeles
Lubalin Graph
Melior
Memphis
Micro Laser
Micro Extended
Mobile
Monaco
Monterey
New Baskerville
New Century Schlbk
New York
News Gothic
NY Nights
Optima
Orator
Palatino
Palo Alto
Park Avenue
Prelude Script
Prestige Elite
San Francisco
Sans Serif

Circle 407 on reader service card

Even the most sophisticated desktop publishing system is incomplete without VeloBind.

Don't let your desktop publishing stop at the printer.



Complete it with VeloBind, the only binding solution that transforms the promise of desktop publishing into reality. VeloBind provides the crucial, finishing touch to desktop publishing by turning any printed material into impressive, authoritative documents. Desktop *publishing* that increases your document's chances of being noticed, read, and accepted.

Only VeloBind allows you to "publish" your desktop publishing in a library-quality hard cover. In under a minute. Or choose from a wide variety of soft cover materials and colors. Even without a cover, desktop publishing bound with VeloBind looks more professional.

All on your desktop.

VeloBind binding systems are compact, fast and easy to operate. Binding that complements your desktop publishing and creates a positive reflection on you. So do yourself — and your desktop publishing — justice. Visit your local computer or stationery store today or call us for more information. Or stop by your local copy shop and use their VeloBind system to complete your desktop publishing.

Because, after all, your desktop publishing is just a stack of paper until it's bound. With VeloBind.



VeloBind®

The desktop binding for desktop publishing.

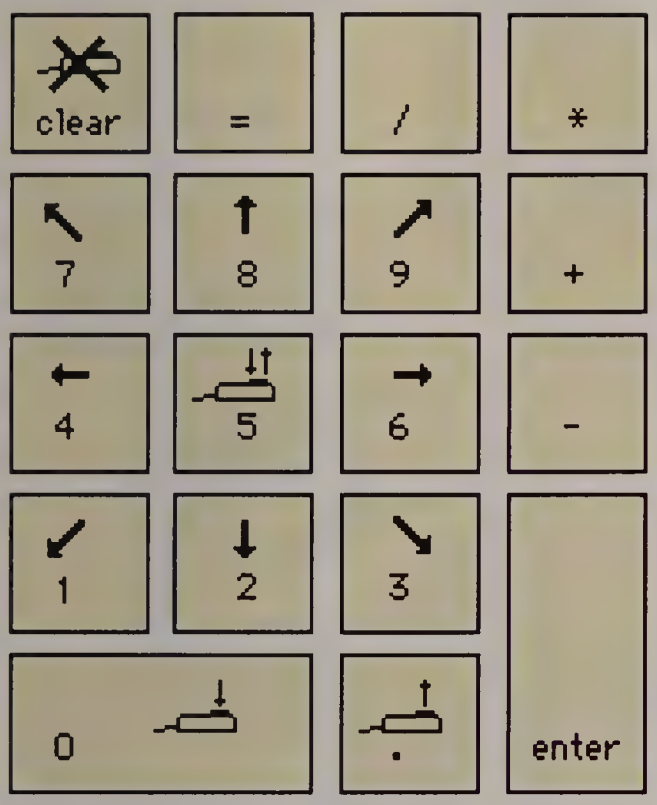
650 Almanor Avenue, Sunnyvale, CA 94086
(800) 672-1822 (inside California)
(800) 538-1798 (outside California)





Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Macintosh is a trademark of Apple Computer, Inc. VeloBind is a registered trademark of VeloBind, Inc.

Circle 27 on reader service card



The Pointer's Keys

The Mouse Keys feature of the Init file Easy Access lets you move the mouse pointer using the keyboard's numeric keypad. To activate Mouse Keys, press ⌘-Shift-Clear. Subsequently, the numeric keys move the pointer as shown here. The longer you hold down a key, the faster the pointer moves; tapping a key moves the pointer one pixel at a time. Pressing the 5 key is equivalent to clicking the mouse button; pressing 0 is like holding down the mouse button, while pressing the period key is like releasing it. To deactivate Mouse Keys, press the keypad's Clear key.

want documentation, you can buy Apple's offical update package through a dealer for $49.) But before you double-click on the Installer, make sure your favorite programs are compatible with the new system, especially if you use system-intensive software such as network file-servers or spoolers.

The Mac system has improved considerably since the days when you risked a crash if you attempted to store more than 150 files on a hard disk. Today's System files offer more speed, features, and reliability than their predecessors, without sacrificing the Mac's easy operating style. And with more expansion options, closer ties to other computers, and still more system improvements on the horizon, 1988 promises to be a banner year.

As for me and my New Year, I'm not making any promises. The only resolution I'll see in 1988 is 72 dots per inch. □

Furniture Just For Mac!



A new slant on comfort! Inmac introduces MacMaster, an all-wood, bi-level workstation that lifts and tilts your Mac six ways for comfort! For only $299, MacMaster makes the time spent on your Macintosh™ more comfortable & more productive! To order MacMaster, just call Inmac today toll-free at 1-800-547-5444. We'll ship it tomorrow!

MacMaster Workstation (Regularly $329) **$299**
No. 4231-A (Oak) **No. 4232-A** (Walnut-stained oak)

inmac®

CALL 1-800-547-5444 TOLL FREE



FREE!

Get the Inmac catalog with over 200 pages of computer supplies including cables, disks, locks, software & workstations for your Mac.

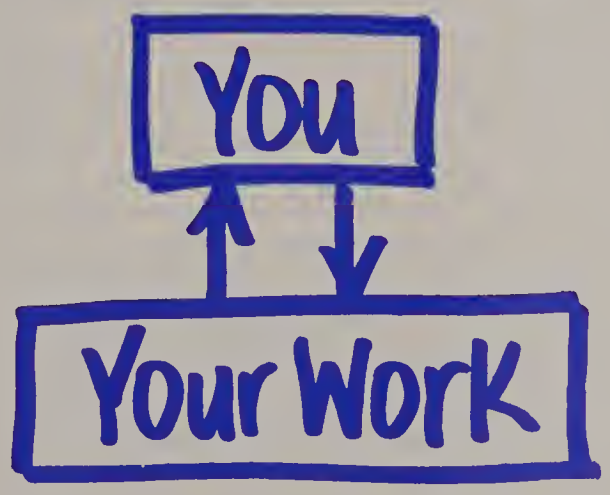
Inmac, 2465 Augustine Dr., Santa Clara, CA 95054

5507

Name
Company
Mail Stop / Suite / Dept. / Bldg / Apt. #
Street Address
City / State / Zip

Circle 592 on reader service card

Our Corporate Philosophy:



Remove the barriers between you and your work. PowerStation™ is a Finder alternative that lets you organize your work for fast and easy access to applications and documents.

PowerStation™

software supply
599 N. Mathilda Ave.
Sunnyvale, CA 94086
(408) 749-9311

Compatible with MultiFinder. Suggested retail price $59.95. Order from your favorite software retailer or call **(800) 443-0100, ext. 451.** This number is for credit card orders **only.** $3.50 shipping/handling charge per order.

Circle 415 on reader service card



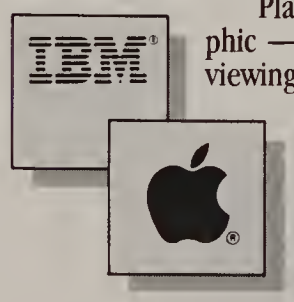
It took Michelangelo four years to complete this masterpiece.



Linda Wilson did it in seconds.

You no longer need to be an artist to create a work of art. All you need is a Princeton scanner. It makes even the most complicated desktop publishing jobs quick and easy. And for what it could cost to create one piece of original artwork, you can own an LS-300F or LS-300 scanner.

Of course, Princeton scanners are IBM PC and PS/2 compatible. And with a Mac Scan™ interface they work equally well with your Apple Macintosh II, Plus or SE. Just make a simple connection and you're ready to go.



Place any original — whether it's a small or large photo, cumbersome book or irregularly-shaped graphic — on the Princeton LS-300F Flatbed Scanner and scan it into your system almost instantaneously. When viewing it on your monitor you'll be amazed at the exceptional clarity that our 300 DPI resolution and gray scales provide.



On the other hand, if you don't need to work with cumbersome originals, our cost effective LS-300 Roll Feed Scanner will leave you with the same image of perfection. Both the LS-300 and LS-300F can be used with PC systems that utilize CGA, EGA or monochrome displays. Or team it up with the Princeton LM-300 or LM-301 Monitors, to allow you to view full page visual effects before printing. An optional trainable OCR software package enables your PC to read and store typewritten pages.

We include PC Paintbrush Plus software (a $149 retail value) with the purchase of each Princeton scanner. PC Paintbrush Plus lets you create image files compatible with Ventura Publisher, PageMaker, etc. for professional quality drawings, diagrams, charts, graphics and headlines. Use your mouse, joystick or digitizer to manipulate the image and create precisely the effect you want. That means you can crop it, reduce it, enlarge it, and of course preview it before anything appears in print on your laser printer.

The next time you need a masterpiece, don't worry. With your Princeton scanner you can create one. For more information contact us at 601 Ewing Street, Building A, Princeton, New Jersey 08540 (609) 683-1660. And gain the visible edge.

LS-300F Flatbed Scanner $1595
The LS-300F is compatible with IBM PC/XT/AT PS/2-Model 30 and Apple Macintosh II, Plus or SE





LS-300 Roll Feed Scanner $1095
The LS-300 is compatible with IBM PC/XT/AT PS/2-Model 30 and Apple Macintosh II, Plus or SE

*300 DPI Desktop Image Scanner
Prices quoted are 110V version

PRINCETON®
GRAPHIC SYSTEMS
THE VISIBLE EDGE

Circle 725 on reader service card

BEST PRICED SCANNER* AVAILABLE!



Business Clinic

Switching to HyperCard–you can take your data with you

by Danny Goodman



SCOTT BALDWIN

It's incredibly difficult to get people to switch from familiar applications. Not only is there the comfort of knowing your way around a particular program, there is often a considerable investment of time in data entry, especially with database applications. My number-two computer nightmare (after disk failure of any kind) is reentering data. I type nearly 100 words per minute not because I like typing, but because I want to get it over with as quickly as possible.

If you've already built up a considerable database of names and addresses, for example, you'll need strong incentive to port it over to *HyperCard*–more than just knowing that *HyperCard* performs full-text searches blindingly fast and can link to other data-intensive applications. You'll want your database to transfer itself magically to *HyperCard*. If that's the case, well, have I got a *HyperCard* button for you.

Before we get to the magic inside this button, however, it's helpful to understand a few fundamentals about Macintosh files and file transfers. This knowledge should come in handy for any kind of data transfer.

The Nature of Macintosh Files

Nearly every Mac application stores its document data in a format unrecognizable by other kinds of computers. This is especially true of files containing information like textual enhancements and graphics, which other computers cannot handle. But even within the Macintosh realm, some programs store information in ways that other programs don't understand; word processing programs, for instance, are notorious for doing this. Only the early popularity of *MacWrite* has made it possible to pass formatted documents from, say, *WriteNow* to *Microsoft Word* via file translation routines (which are a separate program in *WriteNow* but an integral part of *Word*).

Since text created in a Macintosh application must often be shared not only with other Mac programs but with IBM PCs or mainframe computers, there is a *lingua franca* that virtually all computers can understand called ASCII text. ASCII is a standard code system developed by the computing industry to facilitate text transfer. The code number 65 represents the uppercase letter *A* in ASCII. As long as two computers understand that, files may be passed between them.

Most Macintosh programs can accept ASCII text files as well as write them. That's what the Text Only choice means in the dialog boxes that let you save documents (see "The Many Faces of Export"). To accommodate this lowest common denominator, however, programs strip all formatting–like tab locations, boldface, and so on–from the file. Only the raw characters go to an ASCII disk file. When two programs cannot accept each other's own coded files, an ASCII text-file transfer is about the only route left.

For a complete transfer you must export information from one program to a text-only file and then import it to another program (see "Importing Intermediary"). Once the characters are in the document of the second program, you can save the text and any formatting you add in that program's preferred file format.

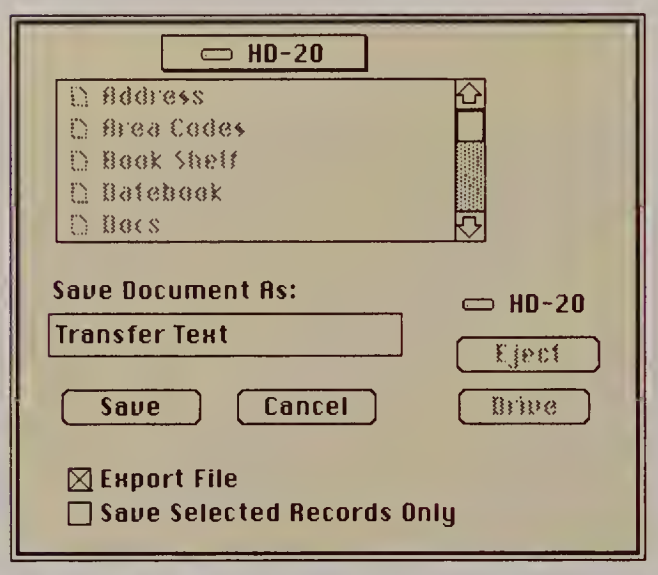
Database Files

If you follow the directions most database programs provide to set up a name-and-address database, your file probably consists of one field for each kind of information–one for name, one for company name, and so on, including separate fields

(continues)

The Many Faces of Export

Not all database and spreadsheet programs adhere to the same methods for exporting their proprietary encoded data to a text-only format. Here are the interfaces for four popular products and the settings you should use to export data for the Import button: *Microsoft Works, Microsoft Excel, Omnis 3,* and *Double Helix.*



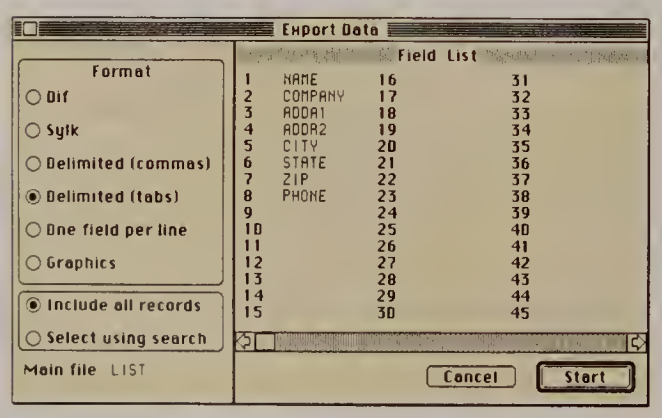
Microsoft Works

Works *provides an Export Data check box to save a database as an ASCII file.*



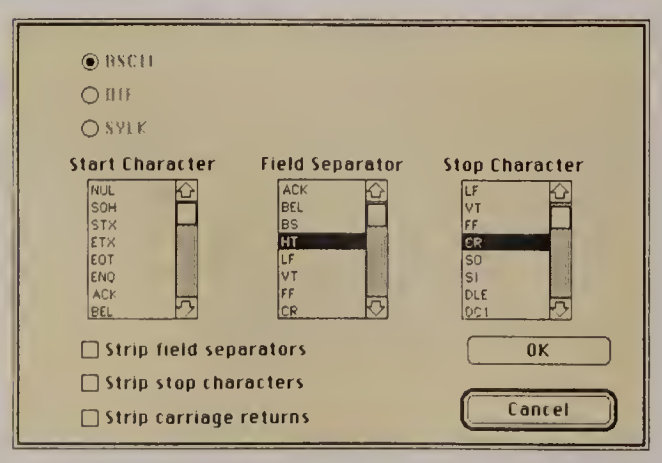
Microsoft Excel

Choose the Text format for exporting an Excel *database.* Excel *places a tab character between columns and a carriage return at the end of a row.*



Omnis 3

Omnis 3 *not only gives you more format choices, but it also lets you select individual fields and specify their order for the exported text file.*



Double Helix

Double Helix *is very flexible, offering choices of any ASCII character for database start character (none is required for the Import button), field separators, and stop character between records.*

for city, state, and zip code (see "Conventional Contacts"). Each form is called a record. For databases, it makes sense to break down information into tiny field elements and records because then you can sort according to any field or select records meeting search criteria for one or more fields.

The tradition in Macintosh file exporting has been to place a tab character between fields and a carriage-return character between records. Even if a field in a record is empty, the export facility puts a tab in the file so that all records appear to have the same number of fields. Not coincidentally, this is the same format that spreadsheet programs such as *Microsoft Excel* use to export columnar data. When writing a spreadsheet to a text-only file, *Excel* places a tab character between cells in the same row and a carriage return at the end of a row.

Omnis 3 and *Double Helix* offer additional flexibility for exporting data. *Omnis,* for instance, provides five methods for formatting text. *Helix* goes much further, by offering a list of all possible characters that you may wish inserted between fields and records. The default settings are HT (horizontal tab) between fields and CR (carriage return) between records.

Data from each record's fields are stored on disk in the order in which the fields were created. Thus, in *Microsoft Works,* if you create a database form and modify the order of the fields, the original order (field 1, field 2, and so on) remains in force, even though the tabbing order of the fields adheres to a sequence of top-left to bottom-right in the entry form. If the receiving program expects the data in a certain order, you must be sure to have your fields set in that sequence.

What HyperCard Wants

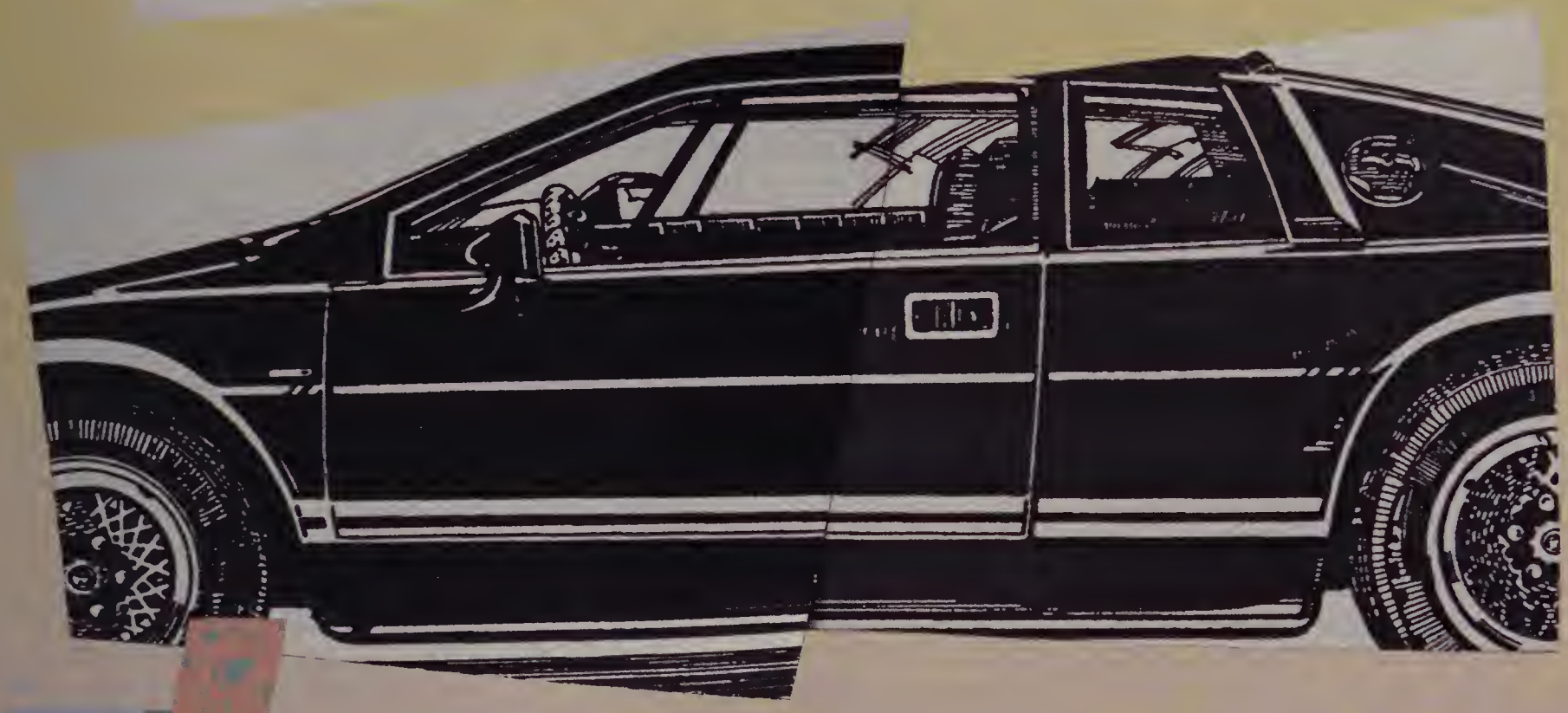
Unlike the typical database record, which contains many fields, the Address stack card in *HyperCard* has only three fields. Of these three, only two contain name, address, and phone data (see "A Stack of Contacts"). The first is a seven-line field, which (if you follow the format of the card as you received it) holds all name and address information. The second field holds the phone number. The third field, at the lower-right corner, is reserved for the stack: it's where the current date goes whenever you update information on a card.

(continues)



These unretouched print samples show the superior print quality of QMS-PS 810 over printers using first-generation print engines.





ntroducing the PostScript laser printer that blacks out at high speeds.

The new QMS-PS® 810 can compose and print the most complex pages in record times, with richer, more saturated blacks than ever before. All with the desktop publishing power of Adobe PostScript®, and the superior print know-how of QMS, an industry leader.

Under the hood QMS ASAP™ (Advanced System Architecture for PostScript) is proprietary technology that helps eliminate the hardware bottlenecks that hinder other PostScript printers. As a result, QMS-PS 810 boasts processing speeds remarkably faster than other PostScript printers in its class. And faster output means greater productivity. In addition, the QMS-PS 810 laser printer's new Canon® SX® print engine covers solid areas and prints fine detail better than previous-generation engines.

The new 8-page/minute QMS-PS 810 laser printer



Fast start, strong finish You can adorn your documents with one or all of the 35 Adobe typefaces. Thanks to PostScript, there's an infinite number of font variations available. You can also make type as large or as small as you want. And put it anywhere on the page. In fact, with PostScript you enjoy total control over the design of your page. It gives you the complete desktop publishing power to do things that would otherwise be virtually impossible. So you get high-quality output exactly how you want it.

Along with PostScript, the HP LaserJet+™, Diablo® 630 and HP-GL™ printer emulations are added for your non-PostScript software.

The QMS-PS 810 laser printer is easy to use, maintain, and comes with a one-year warranty. It's available from Laser Connection dealers. Laser Connection is a sales and marketing subsidiary of QMS. For the dealer nearest you call **1-800-523-2696** .

LASER CONNECTION™

A QMS® company

©1987 Laser Connection

The following are trademarks of their respective companies: QMS, QMS-PS, ASAP, Laser Connection of QMS, Inc. PostScript of Adobe Systems, Inc. Canon, Canon SX of Canon, U.S.A. LaserJet+, HP-GL of Hewlett-Packard. Diablo of Xerox Corp.

Circle 720 on reader service card



A Stack of Contacts

This HyperCard *stack puts the name and address in one field and the phone number in another. The script activated by the Import button converts files from a database to this form.*

So in this case importing a database text-only file involves first reading the data and then combining data from several fields into *HyperCard*'s two fields. To that end, the script attached to the Import button featured here assembles name and address database fields into a single field in the *HyperCard* Address card; the phone number database field goes into the *HyperCard* phone field by itself. For demonstration purposes, I assume a starting database form that looks like the one from *Works* in "Conventional Contacts." Even if your database is set up differently, you'll need to make only slight modifications to the *HyperCard* Import button script to make it work.

Making the Import Button

Listing 1 contains the script for the button. To create this button in your Address stack, first make sure the User Level (in the User Level card of the Home Stack) is set to Scripting. Then go to the Address stack and choose New Button from the Objects menu. A new text button appears in the middle of the screen, preselected for you to drag to an unused area of the card.

Double-click on the button to see its Button Info dialog box. Type the name *Import* into the button name box. Then click the Script button. In the button's Script Editor box, you'll see the opening and ending lines of the script already entered, with the text pointer flashing between them. Type in the script as shown in Listing 1.

What Makes the Button Tick

To help you understand the script so you can change it to suit your purposes, here's a description of the *HyperTalk* commands, starting at the top. This button's script is set in motion when you click the Browse tool atop the button. The first thing that appears is a dialog box requesting the name of the file you wish to import. *Transfer Text* is supplied as a default file name. If you use that name when exporting your database data to a text file, you don't have to type anything into the dialog box; just click OK. (The file to be exported must be exposed in the window of the active disk–not hidden in a folder–for *HyperCard* to find and open it.)

The script places the file name you specify into a local variable, called fileName, and opens the file so that it can be read by *HyperCard*. Then the script sends you to the last card of the stack, where new cards will be added.

Repeatedly Reading

The balance of the script is a series of instructions that the program repeats until the script receives the signal that all importing is complete. The mechanism that stops the importing is within this repeat loop, so

(continues)

Try the new quadLYNX Trackball.



A precision cursor control device in a space saving ergonomic package designed by Honeywell Corp.

quadLYNX trackball is very much like an upside-down mouse. Instead of rolling the mouse on a table top, you roll the ball with your fingertips, thereby moving the cursor on the screen.

quadLYNX handles **all** the same software you have been feeding your mouse.

quadLYNX is versatile, reliable and easy to use, it has an automatic acceleration feature that senses the speed of the ball, when you move the ball faster, the cursor moves further. Also, the "lock" button makes many applications easier to use!

Macintosh and Apple are trademarks of Apple Computer, Inc.
IBM-PC/XT is a trademark of IBM Corporation

Circle 700 on reader service card

MODELS:

For Macintosh, MAC PLUS, APPLE IIe, APPLE IIc
-quadLYNX LX-200-D1

For Macintosh SE, MAC II, APPLE IIGS
-quadLYNX LX-200-S1

*Available for IBM PC's

TO ORDER CALL TOLL FREE:
800-824-3522

* One full year Warranty!
* 30-DAY MONEY BACK GUARANTEE
* Full Mac Software Compatibility

Price: **$99**

ASHER Engineering Corporation

15115 Ramona Blvd., Baldwin Park, CA 91706 (818) 960-4830 (800) 824-3522



The PostScript laser printer sure to get high ratings at its network debut.

The new 8-page/minute QMS-PS 800 II laser printer

The QMS-PS® 800 II is an 8-page-per-minute laser printer that combines the desktop publishing power of Adobe PostScript® with the superior printer technology of QMS, a leader in printer technology for 10 years. Exceptional paper handling, faster processing speed and a Canon® CXD® print engine with 10,000-page-per-month duty cycle give QMS-PS 800 II the versatility your Macintosh™ network needs.

A network sensation QMS-PS 800 II holds 500 pages, so operators aren't constantly refilling depleted paper trays. Users can even designate automatic switching between the two trays for doing letterhead/second page printing. Select faceup or facedown collation. And manually feed odd-sized paper stock.

With QMS ASAP™ (Advanced System Architecture for PostScript) proprietary technology, QMS-PS 800 II delivers outstanding performance. In fact, the more complex the page, the more it outperforms other PostScript printers. Two megabytes of memory, expandable to three megabytes, also add to the overall page processing speed when you are creating complex documents.

Type casting The QMS-PS 800 II comes with 35 resident typefaces (you can download more if you like). PostScript allows you to scale type to virtually any size, from minuscule to mammoth. PostScript also enables you to design, and redesign, your documents with exacting detail. You have total control over the final appearance of documents, with the ability to place text and graphics anywhere on the page. In short, you get the complete desktop publishing power that only PostScript can give you.

Critical acclaim The QMS-PS 800 II is certain to receive rave reviews on your network. And for a single-user set-up, there's the QMS-PS 810 laser printer. For a demonstration of either, call **1-800-523-2696** for the location of the Laser Connection dealer nearest you. And be sure to ask for *The Sourcebook*™ – our exclusive catalog filled with the latest laser printer products and enhancements.

LASER CONNECTION™

A QMS® Company

©1987 Laser Connection.

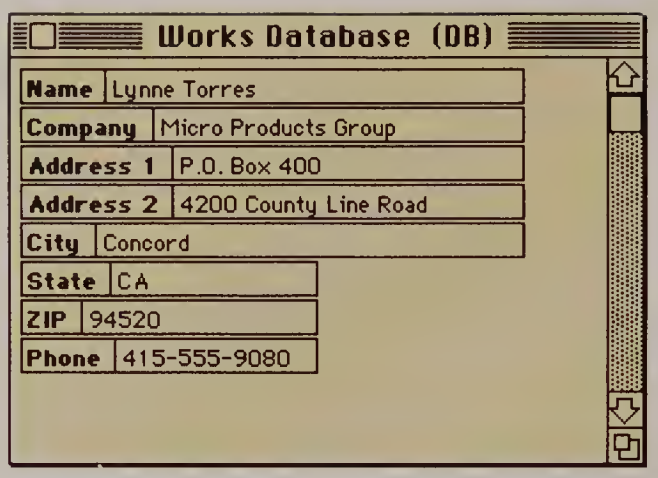
The following are trademarks of their respective companies: QMS, QMS-PS, ASAP, Laser Connection of QMS, Inc. Macintosh of Apple Computer, Inc. PostScript of Adobe Systems, Inc. Canon, Canon CXD of Canon, U.S.A.

Circle 706 on reader service card

there is no danger of getting into an "endless loop," even though the beginning instruction makes it sound as if it will go on forever.

First comes the creation of a new card to receive the first batch of imported text. Then comes another repeat construction nested within the previous one. This repeat loop reads the first seven database fields into memory one at a time and places them in appropriate locations in the Address card's first field. For instance, the first time through the loop, *HyperCard* reads information from the text-only file until it finds a tab character, which signals the end of the first field (in this case, *name*). Next, the tab is removed. As long as the first database field is not empty (if it is, that means there are no more database entries to be read and, therefore, the importation should end), the information just read into memory is placed in the first line of Address card field 1. The second item goes into line 2, and so on, from the first field to the last.

HyperCard encourages you to set up your Address stack in a more common format: city, state, and zip code on the same line (with a comma separating city and state). Therefore, the button's script treats specially the placement of the state and zip code data. For the sixth item (the State field), the script places a comma, a space, and the state data *after* the last entry to field 1, the city. The Put After command does not insert a carriage return. The zip code is similarly placed a couple of spaces after the state.



Conventional Contacts

In a database of contacts, each piece of information goes into a separate field, as in this Microsoft Works *file.* HyperCard, *however, typically groups several fields together, so they must be combined during conversion to* HyperCard *to arrive in the right form.*

Now there's only one item left in the first database record, the phone number. As the last item, it's followed in the text file not by a tab but by a Return character. Thus, the script reads data from the file until it encounters a Return character and places the phone number into the Address card's field 2.

Using the Import Button

When you import data from some databases, you may find the first card holds the database structure instead of a record. A *Works* database text file, for instance, includes as the first record the names of the fields where the data normally goes. If you see this odd-looking card, simply delete it (⌘-Backspace is the shortcut).

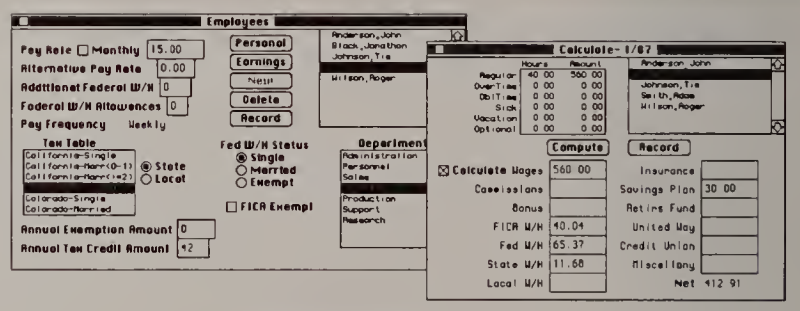
Also, this button script assumes that your database has two address lines. Database records with a blank second-address field leave an empty line in the *HyperCard* Address card. If that blank line bothers you, remove it just as you'd remove an extra line in a word processing document.

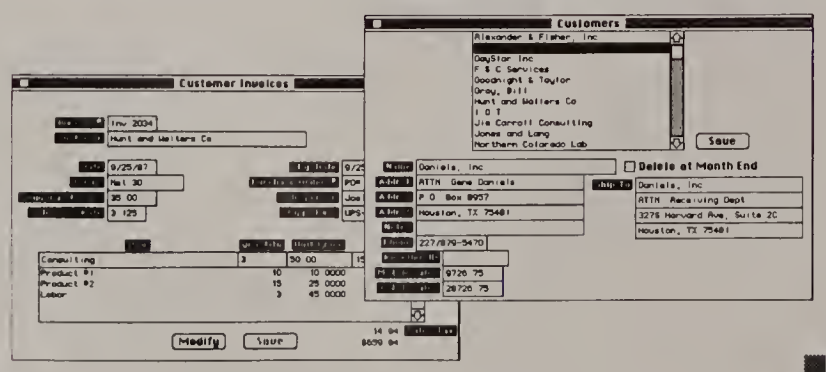
(continues)

Accounting Just Became Easier!

MultiLedger

- General Ledger ***plus*** Accounts Receivable ***plus*** Accounts Payable ***plus*** Inventory Tracking ... all in one easy-to-learn, easy-to-use program!
- Handles multiple companies, each with several departments or profit centers
- Prior period adjustments, automatic or future journal entries, full-year transaction history, budgeting, and prior year comparisons with graphs
- Aging reports, bank reconciliation, flexible financial statements, and many more valuable reports and features





Payroll

- A complete payroll system which can be used as a stand-alone program or can be integrated with **MultiLedger**
- Tax calculations for all states and federal
- Prints paychecks, W-2's, mailing labels, employee earnings register, payroll verification report, check register, posting summary, and tax summary
- Can easily handle multiple companies, departments, categories, pay periods, and compensation methods ... including tips, bonuses and commissions

Demo: $15 Each or $25 Both
Credited toward purchase

Requires
512, 512E,
Plus, SE, or II

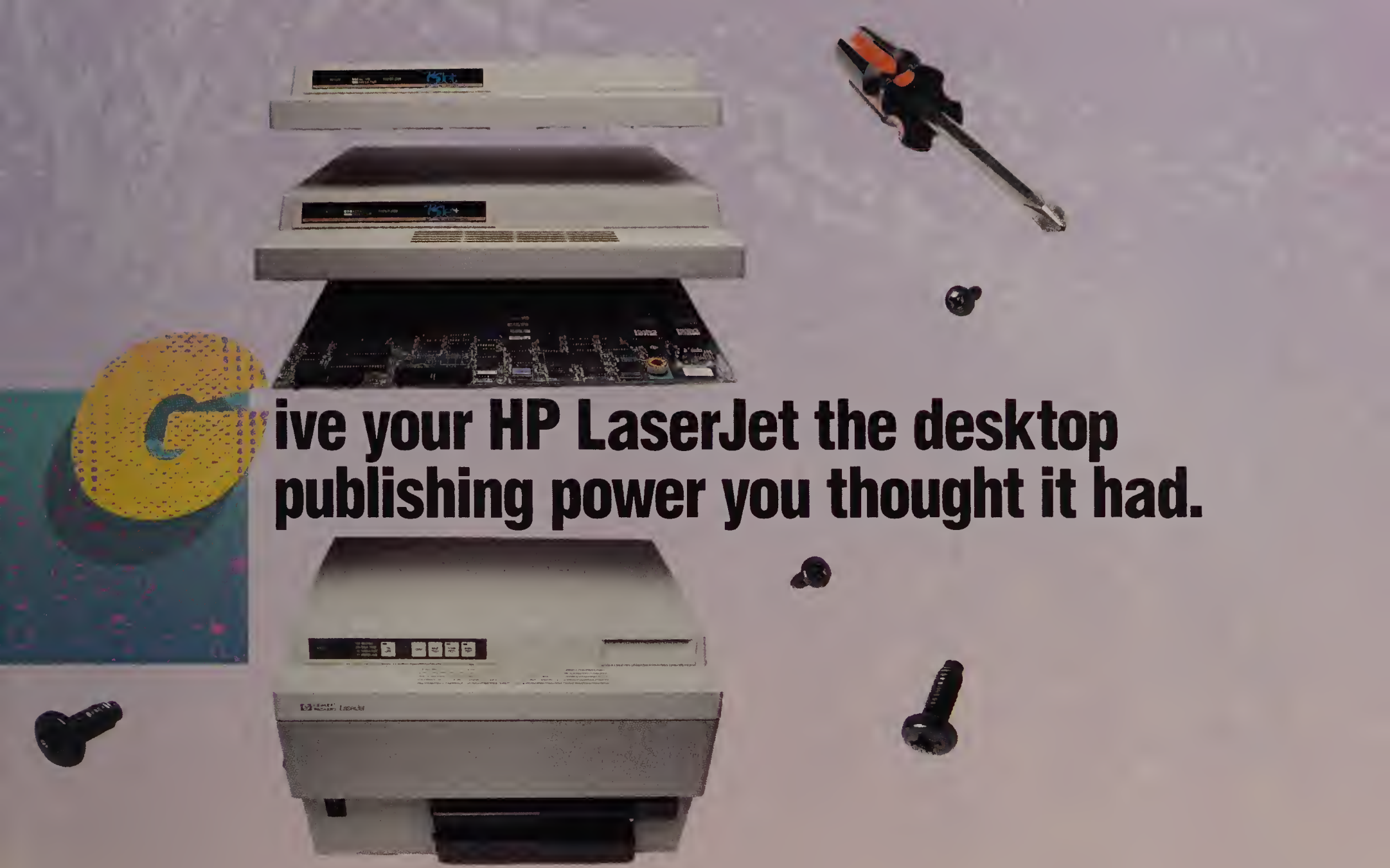
CHECK MARK SOFTWARE INC.

1520 E. Mulberry Suite 200 / P.O. Box 860 / Fort Collins, Colorado 80522
800-426-2466 ext 338 or 303-484-3541
In Canada, call (416) 731-0744
Dealer Inquiries Welcome

60 Day Money-Back Guarantee

See us at
Booth #730
MacWorld Expo

Circle 581 on reader service card



Give your HP LaserJet the desktop publishing power you thought it had.

PS Jet & PS Jet+ PostScript upgrade kits

It can be frustrating to realize your HP LaserJet™ falls short of true desktop publishing capabilities. A PS Jet™ or PS Jet+™ upgrade kit from Laser Connection lets you correct that shortcoming. These upgrades incorporate the advanced print technology of QMS, Laser Connection's parent company, with 10 years' experience in developing print system technology.

Each upgrade kit adds the power of the Adobe PostScript® page-description language, the accepted standard for desktop publishing. They're the only such upgrades available for the HP LaserJet and other laser printers that use the Canon® CX® engine—Canon, NCR,™ QMS, Talaris, CPT, and more.

Master a new language PostScript gives you the ability to exploit the full potential of desktop publishing. It takes you far beyond mere word processing to give you total control over the final appearance of your documents. Place text and graphics anywhere on the page. Design and redesign every detail to your liking. The end result is the high-quality output that you require.

In addition to PostScript, you'll get 13 resident typefaces with PS Jet, and 35 with PS Jet+. Should you want more, we throw in plenty of downloadable font space. Thanks to PostScript, there's an infinite number of font variations available. And every typeface can be printed in sizes from one point to as big as the page and beyond.

A transfer of power All it takes to replace your LaserJet's top cover assembly with the PS Jet or PS Jet+ is a screwdriver (included) and about an hour of your time. Each comes with HP LaserJet+,™ Diablo® 630 and HP-GL™ printer emulations for your non-PostScript software.

Simply put, PS Jet makes your HP LaserJet better *and* protects your initial investment. Call **1-800-523-2696** for the location of the Laser Connection dealer nearest you.

And be sure to ask for *The Sourcebook*™—our exclusive catalog filled with the latest laser printer products and enhancements.

LASER CONNECTION™

A QMS® Company

The following are trademarks or registered trademarks of their respective companies: QMS, Laser Connection of QMS, Inc. Diablo of Xerox Corp. Canon, Canon CX of Canon USA, Inc. PostScript of Adobe Systems, Inc. HP-GL, LaserJet, LaserJet+ of Hewlett-Packard. NCR of NCR Corp.

Circle 767 on reader service card

© 1987 Laser Connection.

```
on mouseUp
  ask "Which file do you wish to import?" with "Transfer
Text"
  if it is empty then exit mouseUp
  put it into fileName
  open file fileName
  go to last card

  repeat forever
    doMenu "New Card"

    -- read the first five database fields
    repeat with theItem = 1 to 7
      read from file fileName until tab
      delete last char of it -- remove the tab character

      if theItem = 1 and it is empty then
        doMenu "Delete Card"
        go to first card
        close file fileName
        exit mouseUp
      else

        -- first 5 items go into their own lines
        if theItem <= 5
        then put it into line theItem of field 1
        else

          -- sixth item (state) goes into same line as city
          -- seventh item (ZIP) goes after state
          if theItem = 6 then put ",  " & it after field 1
          else put "  " & it after field 1
        end if
      end if
    end repeat

    -- put phone numbers into second field
    read from file fileName until return
    put it into field 2

  end repeat
end mouseUp
```

Listing 1

The Import button script retrieves database information saved as a text-only file. Transferring data from a database program to HyperCard *needn't entail retyping.*

Modifying a Database to Fit

I noted earlier that the field order of some databases cannot be altered. For instance, if you create a name database like the one in "Conventional Contacts" but forget to add the Company Name field until the end (and insert it manually near the top of the form), that field will go into the export file last–something you don't want to happen.

To modify the field order, first save the database as a text-only file. Open that file within a spreadsheet program and cut and paste the columns so that they're in the desired field order. Finally, save the spreadsheet file as your Transfer Text file. When the Import button opens this file, the data will be in the correct order.

You no longer have an excuse for not trying out your card-file databases in *HyperCard*. Let me know how it compares to your trusty database for quickly looking up addresses and phone numbers. □

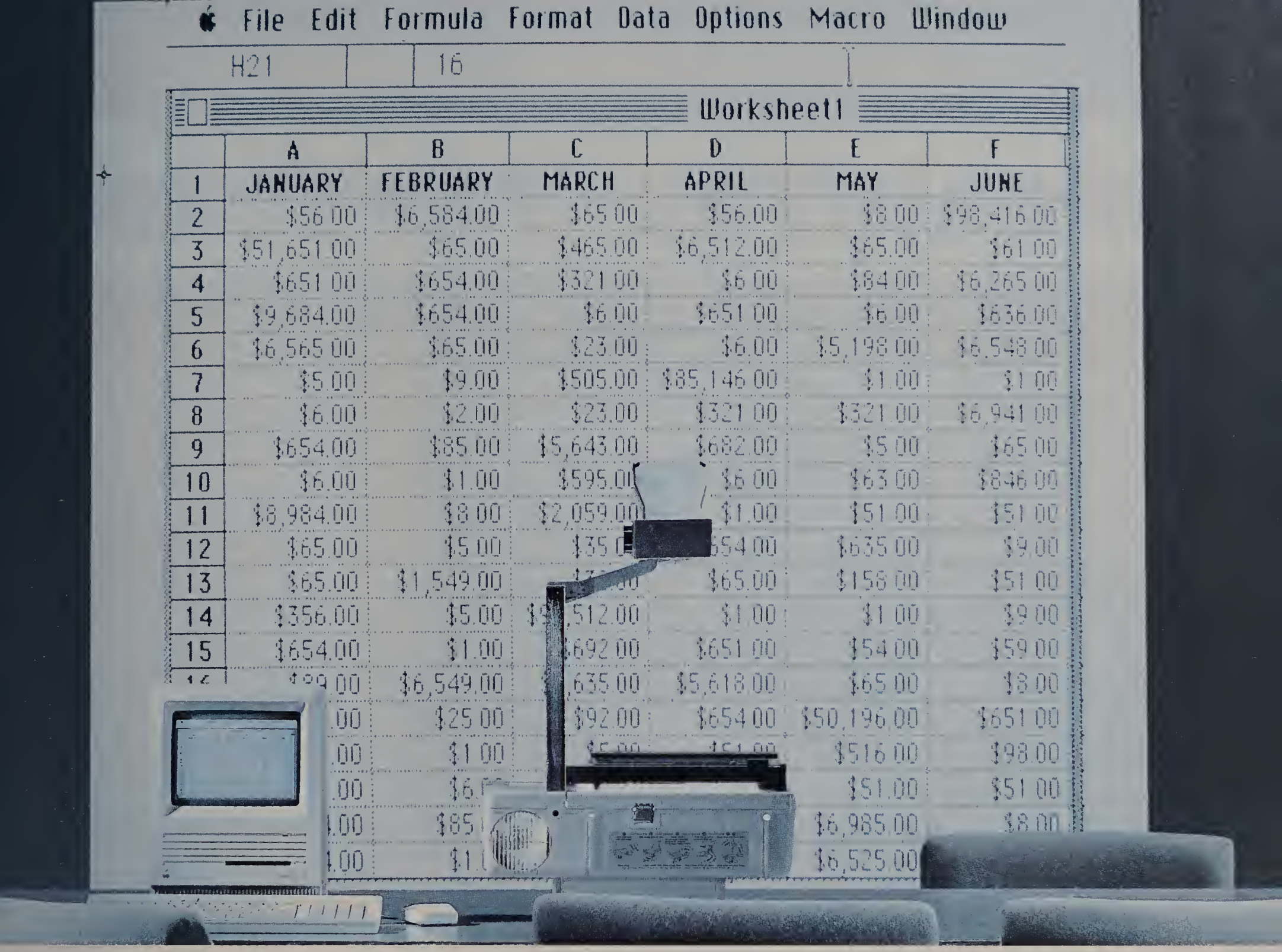


RESULTS OUT.

If you manage, think, write, or plan, you need ThinkTank. It's the smart executive's competitive edge. ThinkTank is almost effortless organization. Pure. Simple. Highly practical. Just put your ideas in. The results will knock you out.

For more information, call 1-800-441-7234, in CA 1-800-626-8847.

LIVING VIDEOTEXT
A Division of Symantec
117 Easy Street • Mountain View, CA 94043 • (415) 964-6300



Make your Mac larger than life.

Attach your Macintosh to our 6448C+2 Ultimate Presentation System (UPS) and place it on any standard overhead projector. Suddenly you've got an interactive Mac display that scales up to even the largest audiences.

Or download your display information into the UPS's megabyte of memory and take it virtually anywhere. (Lifetime batteries included.)

- High resolution monochrome projection (640x480 pixels)
- Heat tolerant to 65° C (149° F) — no fan
- One megabyte of memory
- Page scroll/windowing/special effects generator
- Compatible with the entire Apple Macintosh family

Fully compatible with: Macintosh™ 128K, Macintosh 512K, Macintosh Plus, Macintosh 512Ke, Macintosh SE (video adapter required), and the Macintosh II (with video card).

So put your Mac in the big time today. For more information on the UPS or the name of your closest dealer, phone today — **800-327-7231.**



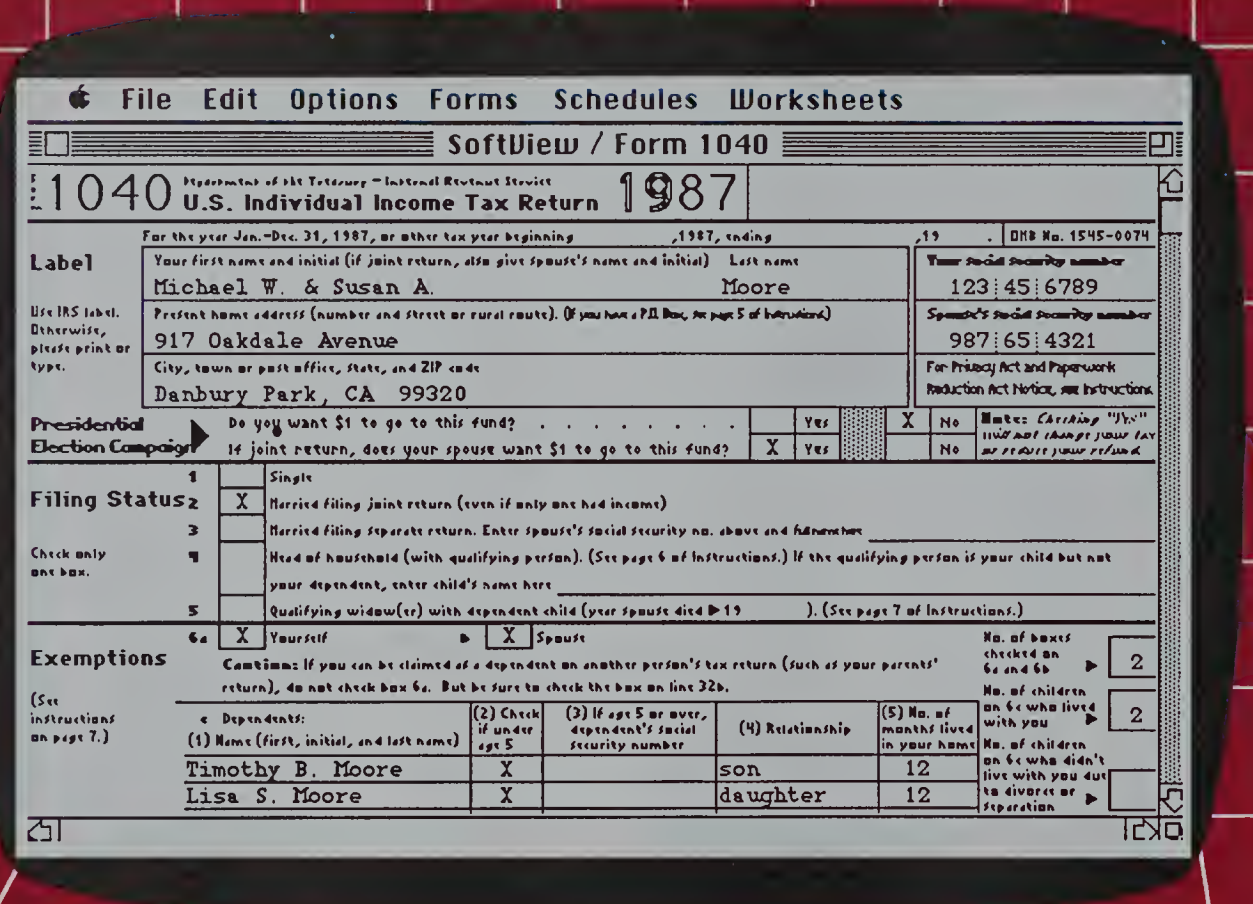
IN FOCUS SYSTEMS INC.

7649 Southwest Mohawk St. · Tualatin, Oregon 97062 · 503-692-4968

Dealer Inquiries Invited.
Trademarks/owner Macintosh/Apple Computer, Inc

Circle 586 on reader service card

MacInTax™ / TaxView™



THE INCOME TAX PROGRAM

- **DISPLAYS EXACT FORMS ON SCREEN** - enter data directly into displayed forms. Automatic calculations and linking across all forms, schedules, worksheets and itemizations
- **STATUS WINDOW** - displays Adjusted Gross Income (AGI), Taxable Income, Total Tax Liability, and Refund/Balance Due.
- **IRS INSTRUCTIONS ON SCREEN** - displays entire IRS booklet on a line-by-line basis.
- **PRINT ENTIRE TAX RETURN WITH ALL DATA** - all printouts IRS APPROVED FOR SIGNATURE AND SUBMISSION, INCLUDING FORM 1040.
- **INTERFACES TO SPREADSHEETS, DATABASES, AND ACCOUNTING PROGRAMS** - import "text" files directly into the program.

MacInTax/TaxView FEDERAL: suggested list price - $119.95*

Operates on IBM and compatibles, Apple® Macintosh™, and Apple IIGS.

CA & NY STATE SUPPLEMENTS (others to follow): list price - $65.95*

Requires MacInTax Federal or TaxView Federal to operate. Includes a converter program to link saved federal data to state forms.

PLANNER SUPPLEMENT: list price - $79.95*

Performs five-year projections of tax liabilities for five alternative strategies, using the new tax laws. Requires MacInTax Federal to operate.

* plus $5.00 ship/handling, CA res. add 6% sales tax

Macintosh™ and Apple IIGS are trademarks of Apple Computer, Inc.
IBM is a registered trademark of International Business Machines, Inc.
MacInTax™, TaxView™, and SoftView™ are trademarks of SoftView, Inc.

SOFT VIEW
SoftView® Inc.

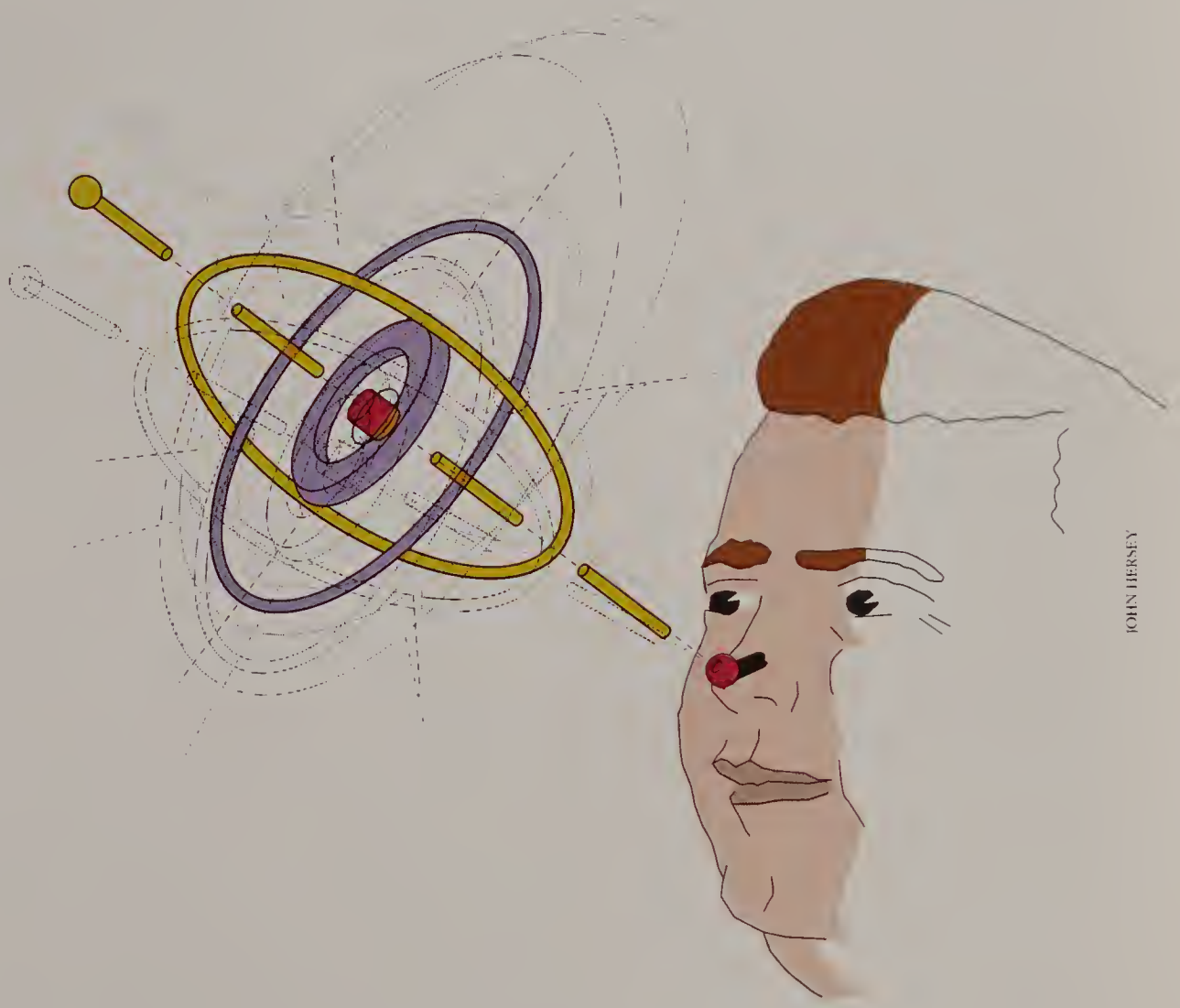
4820 Adohr Lane, Suite F
Camarillo, CA 93010
1-805-388-2626
ORDERS ONLY: 1-800-622-6829

Circle 178 on reader service card

Insights on Adobe Illustrator

Tips for the path to proficiency

by Bruce Maurier and Kevin Rardin



JOHN HERSEY

Adobe Illustrator hit the drawing and drafting market with a splash a year ago. Though the program takes considerable time to learn, the professionals who have invested the effort to master it find that effort paying off daily in their publishing and graphics production tasks. Both of us are among the converts. After months of experimentation–and headaches–we've settled on *Illustrator* as the best tool for any kind of line art in our electronic publishing businesses.

Anyone familiar with the most popular Mac graphics programs sees immediately that *Illustrator* is a world apart. But much about the program's operation is not immediately obvious. Through working with the program on a daily basis and constantly referring to Adobe's complete but rather oblique manual, we have uncovered the techniques detailed here. We assume you have a basic understanding of *Illustrator,* but these tips will aid the casual user as well as the graphics professional who every day produces technical, marketing, or advertising line art.

Thanks to David Smith of David Smith/Design, Sausalito, California, for pointing us in the right direction.

The Driver's Seat

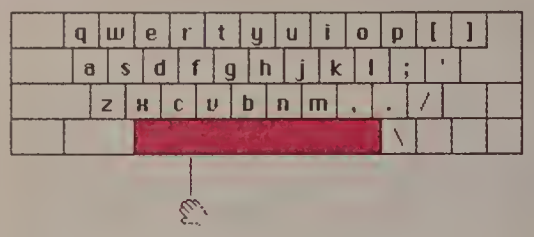
Illustrator's keyboard commands and mouse modes can put you in the driver's seat at your electronic drawing board. Until you gain proficiency in these keyboard shortcuts, working with *Illustrator* may seem frustrating and awkward compared to using traditional tools. When you are drawing with pen and ink, you just reach for a tool and draw with it. Similarly, with *Illustrator,* you can draw with the Pen tool, then press the ⌘ key and instantly reposition an anchor point to redraw a line. Or you can press the option key and the spacebar together, point at part of the page, and zoom in at 200 percent increments. You can't do that with pen and ink.

Study the shortcuts listed here and on *Illustrator*'s Keyboard Summary Sheet and experiment with them (see "Keyboard Shortcuts"). With your left hand on the keyboard and your right on the mouse, the only thing missing is an accelerator pedal.

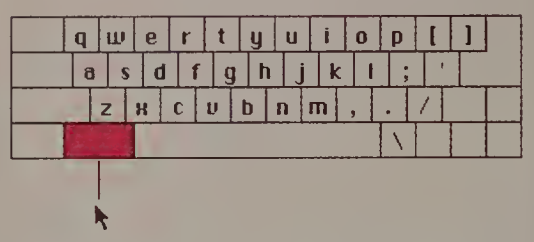
Joining Together

If you want to Join (⌘-J) the ends of two paths exactly, remember to Average (⌘-L) them first. The two points may only *appear* to be in the same place, separated by a pixel or two. Later when you scale, rotate, or reflect the figure, that little discrepancy can become a big headache. To avoid the problem, zoom to 800 percent, bring the two paths together until they touch, and then move them a bit closer so that they overlap by one little jump of the line

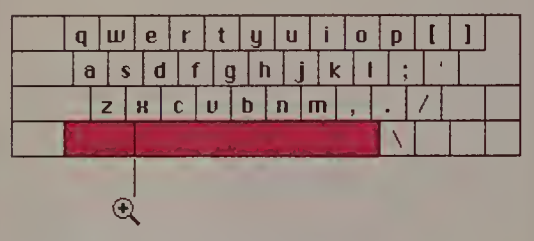
(continues)



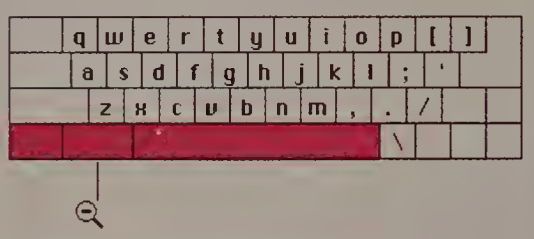
Press spacebar with any tool selected to select Hand Tool.



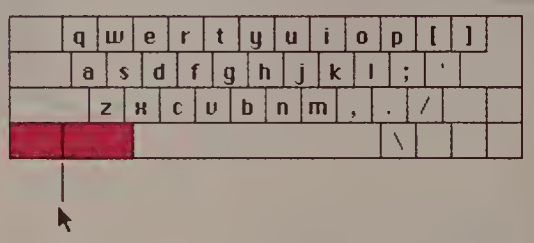
Press Command key at any time to access selection pointer.



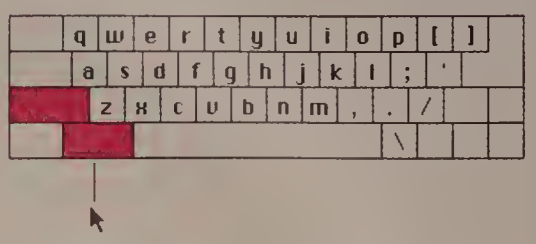
Press Command key and spacebar together to access zoom-in pointer.



Press Option key, Command key, and spacebar together to access zoom-out pointer.



Press Option key and Command key together with selection pointer (controlled with mouse) to select a complete path.



Press Shift key and Command key together with selection pointer to move whatever you're pointing at while constraining that motion to 90 and 45 degree angles.

Keyboard Shortcuts

Keyboard commands make short work of even painstaking Illustrator *procedures. Here is a handful of invaluable shortcuts that accelerate the drawing process.*

on your screen. When selected, the two anchor points should look like one—not one and a half. Now joining the two paths should not trigger that latent migraine.

Cutting Asunder

The Scissors tool chops circles, ovals, rectangles, and squares into the pieces needed for a drawing. You must ungroup (⌘-U) the shapes before cutting them with the Scissors.

For example, if you need a box with rounded corners, you might go nuts trying to do the job with the Pen tool. Instead, hold down the Shift and Option keys to draw a circle (from its center) with the same curve in one of its quarters that you want at the corner of your box. Ungroup the circle. With the Scissors, clip the circle's four anchor points to produce four equal quarter-circle arcs. Move the arcs apart, using the Shift key to keep them aligned. Now it's easy to connect the corners with the Pen to complete the box. If you want to specify in points exactly how far away the arcs should move, select two adjoining arcs using the Option key and the marquee. Holding the Option key down, select the pointer from the tool palette, type the number of points, and select Horizontal or Vertical. (Use positive numbers for right or upward movement, negative numbers for left or down.) Then move the third arc following the same procedure and connect all four arcs with the Pen to finish the box.

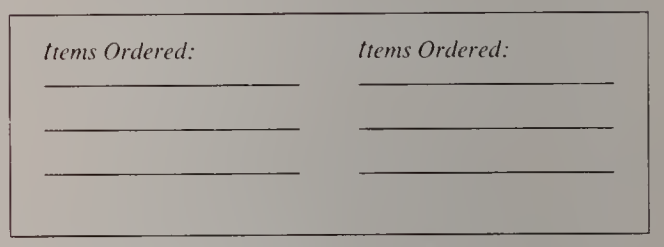
The Key to Alignment

When you begin using *Illustrator* for work that requires careful alignment, you quickly discover the program has no system of grids or guides that you might expect from other Mac graphics programs. Having committed to *Illustrator* for your project with no time to look back, you might think you'll just have to align everything by squinting—and by keeping a very steady hand on the mouse.

The manual's index and glossary suggest that alignment is something to do only with type. And even though you may have read everything the documentation has to say about constraint, experimented with the Shift (Constrain) key, hit ⌘-K, and sniffed warily at the Constrain dialog box, somehow the word *constrain* fails to convey *alignment*.

In fact, the secret to alignment is mastering constraints. When you hold down the Shift key during a movement in *Illustrator,* you force, or constrain, the object you are moving to follow one of eight exact paths. It is as though you are creating an invisible grid when you hold down the Shift key. In combination with the Option key and Transform Again command (⌘-D), you can use this invisible grid to solve most of the toughest alignment problems.

Consider a simple order form (see "An Orderly Approach to Alignment"). With no apparent grid, and only the aid of the rulers at the edge of the drawing area, aligning the eight elements would appear to be more trouble than it's worth.



An Orderly Approach to Alignment

By leaning heavily on Illustrator*'s Constrain option, you can easily create, move, or copy items in perfect alignment, whether for forms or for drawings. Here, an orderly form emerges in seven easy steps, as described in the text.*

Actually, you can easily align everything in the form with the first object you create, without ever resorting to the remote rulers. To make a form as in the example, first enter the left-aligned text, *Items ordered:*. With the Pen tool, click one to set an anchor point directly on the anchor point of the text block. While holding down the Shift key to force the new path to follow *Illustrator*'s preset axis of constraint, set the other end of the path horizontally to the right to draw the first line of the form.

Now Option-click to select the line, and then drag it away from the text. *After* the line begins to move, press the Shift key again to put it under the power of the invisible grid. When the line is in place, release the mouse button and then the Shift key. To position the line a specific number of

(continues)

See Us At
Macworld Expo
Booth # 1827

Raw Power

Fastest 80MB Available for Macintosh II





A complete family of internal and external hard disk sub-systems for Macintosh Plus, SE & II.

Call today for the name and number of your nearest CMS dealer.

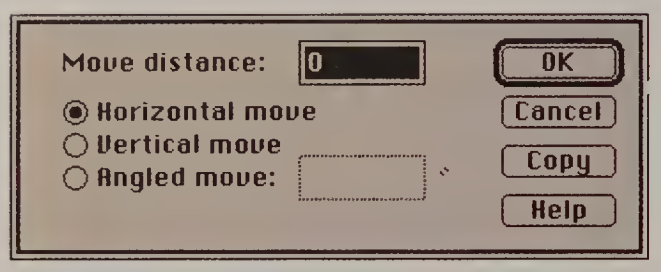
CMS Enhancements, Inc.
1372 Valencia Avenue, Tustin, CA 92680 (714) 259-9555
Telex (023) 371-8711 FAX (714) 549-4004

CMS®

Macintosh is a registered trademark of Apple Computer Corporation.
CMS is a registered trademark of CMS Enhancements, Inc.

Circle 657 on reader service card

points below the baseline of the text, instead of dragging it hold down the Option key and click on the pointer tool. Then specify in the dialog box how many points away you want the line to go–horizontally, vertically, or at an angle (see "Moving Pictures"). Use positive numbers to go right or up, negative numbers for left or down.



Moving Pictures

For precise positioning, use Illustrator*'s dialog boxes to specify exactly how much–in points or degrees–to change an object. This Move box appears when you select an object and then hold down the Option key while clicking the pointer in the tool palette. Similar boxes appear when you select a transformation tool and then hold down the Option key as you click the object at its transformation point.*

With the line still selected, move it down again. But this time press Option along with Shift and then release the mouse button to place an exact copy of the first line below. (If you use the dialog box for the move, click Copy instead of OK to obtain the same result.)

With the second line still selected, press ⌘-D (Transform Again, on the Arrange menu) to create another copy perfectly aligned with the other two lines and the text above.

Now select all four elements, either with the marquee or by pressing ⌘-A (Select All). Click on any element and drag the entire cloned group to the right. Once the group begins to move, press Shift to hold the elements in perfect horizontal alignment with the original. When the group is in position, press Option (in addition to Shift) to leave an exact copy when you release the mouse button.

Finally, deselect the copy by clicking on the background and select the text in the copy without moving it. The surest way to do that is with the marquee–selecting an object in *Illustrator* with the pointer often moves it accidentally. Press ⌘-T (Type, on the Style menu) to bring up the Text dialog box. Type *Send to:* to replace the selected text. Don't change the type font, size, kerning, leading, or–most importantly–location. There is now no need for manual alignment. Everything has been aligned with the first element created, using only Shift, Option, and ⌘-D. Once you learn to keep the first, second, and third fingers of your left hand on the ⌘, Option, and Shift keys, the whole operation should take about 30 seconds.

The Angle of Repose

Illustrator's ability to make objects follow the eight horizontal, vertical, and 45-degree-angle paths would be merely useful if it weren't for the fact that the paths' orientation can be reset at any angle on the page (see "Illustrator's Compass"). A few words about adjusting the angle of constraint might be in order here.

There are two ways to change the orientation of *Illustrator*'s invisible grid. After selecting Constrain from the Arrange menu (or pressing ⌘-K), you can type the desired angle of the horizontal axis into the dialog box and all the invisible grid lines will rotate along with the horizontal axis, just like the example compass in the figure, always at 45-degree angles from one another. Typing a positive number rotates the grid counterclockwise; a negative number rotates it clockwise. The grid's new orientation stays in effect until you change it again–ready to go to work whenever you press the Shift key during the transformation of an object.

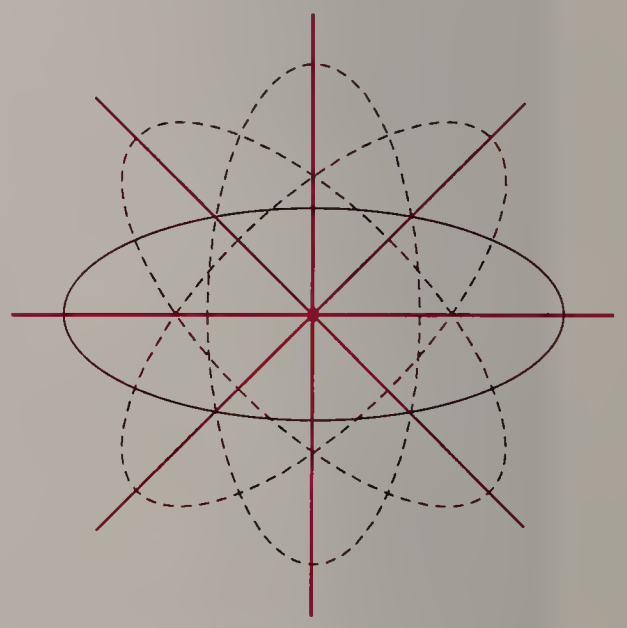
There is a second way to change *Illustrator*'s axes: create the line you want your customized invisible grid to follow. You can establish a new axis either by selecting two points of an existing straight line that has the correct angle or by selecting two anchor points in the drawing. With the points selected, press ⌘-K and the dialog box announces what angle you have selected. Click OK to accept the angle; all movements and transformations of objects will follow that angle whenever you use the Shift key.

Also, any squares, rectangles, circles, and ovals that you subsequently create align their symmetrical anchor points with the new grid. (Objects you have created before changing the axes do not shift, however.) This greatly simplifies the creation of axonometric drawings, as well as technical line drawings involving tightly spaced lines and complex perspective angles. Angles don't have to be figured, checked, and rechecked. With the help of the almighty Shift key, simple lines and complete figures can be forced to align with one another along the same invisible lines. Even text follows the current angle of constraint.

Using any of the transformation tools–scale, rotate, reflect, and shear–with the Shift key forces the transformation to follow the same invisible grid.

For example, holding the Shift key down while scaling an object restricts it to expanding or shrinking only in the grid's eight basic directions. Rotating an object about a point with Shift held down forces it to snap into one of eight positions. When you reflect an object while pressing the Shift key, the reflection can appear across only one of the eight angles. And the orientation of an object you shear while holding

(continues)



Illustrator's Compass

Ordinarily Illustrator*'s angles of constraint match the eight points of the compass in the center foreground of this drawing, but you can reset the angles. You can rotate, scale, shear, or reflect objects along the constrained paths–just press the Shift key while executing the transformation. Here, the rotation and scaling were limited to 45-degree rotations, making a complex geometric design easy to create.*

Power Backup

Fastest Macintosh Backup Subsystem on the Market

60 MB SCSI Streaming Tape Backup for Macintosh Plus, SE and II.

Operating modes: mirror image, file-by-file and incremental.

The TS-60/E backs up and restores any SCSI Hard Disk on line.

CMS offers a complete line of SCSI Hard Disk Subsystems for the Macintosh Computers.

BEST PRICE

BEST PERFORMANCE



CMS

CMS Enhancements, Inc.
1372 Valencia Avenue, Tustin, CA 92680 (714) 259-9555
Telex (023) 371-8711 FAX (714) 549-4004

Call today for the name and number of your nearest CMS dealer.

CMS logo is a registered trademark of CMS Enhancements, Inc.
Macintosh is a registered trademark of Apple Computer Inc.

Circle 619 on reader service card

down the Shift key follows–you guessed it–any one of eight angles. With judicious use of the Option key you can create copies of the original object in perfect alignment with the original. By scaling, rotating, reflecting, or shearing, you command a wondrous array of special effects.

For us lowly mouse jockeys, however, the most important use of *Illustrator*'s invisible grid comes in the daily demands for tables, graphs, charts, logos, icons, and simple but elegant line drawings. What once might have taken hours with pen, ink, protractor, and T-square now takes only a fraction of the time. Select, move, Shift/Option, release, ⌘-D, ⌘-D, ⌘-D...

No grid in *Illustrator?* Hah.

Through the Looking Glass

A trouble spot we encountered when learning *Illustrator* was in mastering the Reflect tool. It's easy to understand if you take its name literally. Use this tool as if you were setting the edge of a mirror down to reflect something you've drawn. You set two points with the tool to define an imaginary line that represents the edge of the mirror. If you hold down the Shift key while doing this, the reflection aligns with one of the current angles of constraint. If you hold down the option key, the reflection leaves the original in place and creates a copy across from it. We often use the Reflect tool to create the other half of a symmetrical figure, copying across the vertical and horizontal axes and then joining the connecting anchor points.

Incidentally, we rarely trust fate by reflecting objects–or for that matter, scaling, rotating, or shearing them–manually. Whenever you employ one of *Illustrator*'s four transformation tools, hold down the Option key when you click to establish your first point in the drawing. The dialog box that appears allows you to specify exactly how much and in which direction you want things to happen. And ⌘-D allows you to repeat any operation as many times as necessary.

The Skinny on Scanning

Although people use *Illustrator* as a freehand drawing system, Adobe designed it primarily to be used with scanned im-

SONY®
Packaged 10 Per Box

	2 BOX	5 BOX	10 BOX
3½" Single Side	10.95	10.60	9.95
3½" Double Side	15.95	15.50	14.95
HIGH Density	46.95	45.95	43.95

SONY, without labels or box
Packaged in Fifties

MAC-PAC-50's	50	100	400
3½" Single Side	.95 EA.	.92 EA.	.87 EA.
3½" Double Side	1.25 EA.	1.21 EA.	1.15 EA.

"Old Reliable" the Diskette Connection™
Delaware 1·800·451·1849 P.O. BOX 10247, WILMINGTON, DE. 19850
Oklahoma 1·800·654·4058 P.O. BOX 1674, BETHANY, OK. 73008
Nevada 1·800·621·6221 P.O. BOX 12396, LAS VEGAS, NV. 89112
Minimum Order $25.00 · Visa, MasterCard accepted · C.O.D orders add $3.00 · Surface Shipping on 3.5 or 5.25" add $3.00 per 100 disks. 8" add $4.00 per 100 disks. UPS delivery only. U.S. mail for APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!
Telex #4933362 Fax #405·495·4598

"Orders Accepted Worldwide"

3M


Authorized Distributor
Magnetic Media Division Products

	2 Boxes	5 Boxes	10 Boxes
3½" S·Side	11.95	11.50	10.95
3½" D·Side	16.50	15.95	15.50
HIGH Density	47.95	46.95	44.95

"Old Reliable" the Diskette Connection™
Delaware 1·800·451·1849 P.O. BOX 10247, WILMINGTON, DE. 19850
Oklahoma 1·800·654·4058 P.O. BOX 1674, BETHANY, OK. 73008
Nevada 1·800·621·6221 P.O. BOX 12396, LAS VEGAS, NV. 89112
Minimum Order $25.00 · Visa, MasterCard accepted · C.O.D orders add $3.00 · Surface Shipping on 3.5 or 5.25" add $3.00 per 100 disks. 8" add $4.00 per 100 disks. UPS delivery only. U.S. mail for APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!
Telex #4933362 Fax #405·495·4598

Circle 562 on reader service card

ages called templates. Preparing the scanned image properly can save hours of time in obtaining a satisfactory working image. A scanned image is brought into *Illustrator* as a bit-mapped image on a non-printing background.

There are several adequate scanners on the market, but our current favorite is Thunderware's ThunderScan unit. For the price it is the best digitizer for black-and-white line art, though it works better with the ImageWriter I. The software that accompanies ThunderScan lets you manipulate the image in FatBits directly in the scanned-image window. Alternately, you can export a single page of the image to your favorite paint program (*MacPaint, FullPaint,* or *SuperPaint*) and doctor it there.

The most common complaint about scanned-image templates in *Illustrator* is that they end up being skewed or distorted. You can avoid this with a little care. If you start with a photocopied image, take the time at the copier to make sure your image is properly aligned on the page. Run test copies of the original until you are completely satisfied with the alignment. If you are copying the image from a book, flatten the pages on the copier glass. Excessive curl on the pages distorts the copied image. Make sure there is plenty of white space surrounding the image, especially at the top of the page.

When you take the photocopy to the digitizer, again make sure the image is lined up squarely for the scanning head or on the glass surface of a flatbed. Position the photocopy against the printer's platen; pull it about halfway way through the roller with the paper bail pulled away from the paper and the tension released. Now square up the image, using the paper bail as a guide. If the image is slightly skewed on the photocopy, skew the page to compensate so the *image* is lined up in the printer. Engage the tension, put the paper bail against the photocopy, and scan.

On a flatbed scanner you may need to scan repeatedly until you get the alignment just right. It is far easier to square the image now than to try to fix it in a paint program.

Remove artifacts of the digitization process–spurious dots and shadows–from the scanned image with the eraser in ThunderScan's image window or in your favorite paint program. You may want to go into FatBits to quickly eliminate the finer artifacts of digitization. You want to start with the cleanest template in *Illustrator,* so your tracing will accurately represent the original art. Tracers less finicky–or more hasty–than we are might be content to merely overlook the extraneous dots as they go along.

Clipboard Realities

A great deal of confusion and controversy surrounds the issue of importing *Illustrator* art into other Macintosh programs. Even if you're not using a program (such as *PageMaker*) that supports the Encapsulated PostScript Format (abbreviated EPS or EPSF), you can import *Illustrator* art in PostScript form into most programs that support the Macintosh Clipboard or Scrapbook.

The key to profitable exporting is pressing the Option key when you copy. That makes a PICT-format image of what you've selected to copy from *Illustrator.* However, this is no simple PICT image. Embedded in it is the PostScript code necessary to draw the image after you paste it into a program such as *Microsoft Word* or *ReadySetGo.* As long as the program supports the Clipboard properly (which is not always the case) the image should print properly. Try this for yourself with your favorite applications. We have confirmed that this process works for *Trapeze* 2.0, *Microsoft Word* 3.01, *ReadySetGo* versions after 3, and *PowerPoint.* One exception we've indentified is *Cricket Draw* version 1.0, which makes an odd array of boxes instead of the image you expect. And if you export an *Illustrator* image into a paint program, it becomes a simple bit map.

More Tips

If you've uncovered a tip or shortcut we haven't included in this article, send it to *Macworld.* The magazine pays $25 to $100 for hints published in the *Quick Tips* column. Send your contributions to *Quick Tips, Macworld,* 501 Second St., San Francisco, CA 94107. □

See *Where to Buy* for product details.

The Mac Group
P.O. Box 85152 MB231
San Diego, CA 92138

Offering the very best **Freeware** and **Shareware** through the convenience of mail order user group distribution.
Send $1 for catalog.

Fonts
new Stackware
DAs

LifeTime Membership
(optional) Includes Sampler Disk, TMG Catalog, and big 15% Discount on purchases. Only $15.

BigTime Membership
(optional) Includes Sampler, Catalog, Discounts plus 750K of new PD every month. $72 / year.

Roll-Your-Own PD Disks
Pick & choose from a complete listing of thousands of PD titles. Send $5 for RYO Catalog.

Special Art Set
Includes 12 disks of public domain MacPaint™ art for only $50 + $3 s/h.

VISA / MasterCard Orders
1-800-621-5640-622-477

Games
ClipArt
Utilities

and more...

Circle 599 on reader service card



Mac's Missing Link

The Parallel Printer Link

If you own a Mac Plus, SE or II, at last there is available a link to all popular parallel printers. For 9 pin printers it's the Grappler® C/Mac/GS* and for 24 pin printers or laser printers use the Grappler® LQ.

The Evolution of Printer Connectivity

Since the dawn of the Macintosh,™ connecting anything but an Apple® printer has been a scientific challenge. Drivers, installers, custom cables, page size adjustments and other "solutions" have defeated even the heartiest adventurers. Now, the Grappler C/Mac/GS (for 9 pin models) and the Grappler LQ (for 24 pin and laser models) make connecting a non-Apple printer as easy as plugging in a cable.

The secret to our successful interface is that the Grappler uses Apple's existing printer drivers which are already compatible with all your software. The Grappler performs two important tasks. First, it converts serial to parallel. Then, it interprets the Imagewriter II or LQ code into your unique printer codes. So all you do is set the Grappler's single DIP switch once and plug it into any Epson, Toshiba, Okidata, Star Micronics, Panasonic or other supported dot matrix printer.** It's that easy!

The Revolutionary Laser Link

The Grappler LQ goes beyond a 24 pin dot matrix printer interface. With powerful spooling software, it uses the ImageWriter LQ output to create comparable hi-resolution images on any HP compatible laser printer. Now the printers you have serving other PC's can work for your Mac as well. The Grappler LQ brings the cost of laser printing within the reach of the rest of us.



A Trusted Family Name

Although the Grappler series is new to the Macintosh, it is well known for enhancing Apples. With over 550,000 units sold, Grappler printer interfaces are among the most popular add-ons in the history of the personal computer. With a reputation for quality, innovation and excellence, you can trust Orange Micro for your Macintosh printer interfacing needs.



*The Grappler C/Mac/GS version also serves as an interface for the Apple IIc and IIGS.
**Ask your dealer or call Orange Micro for specific model compatibility.

© Orange Micro Inc. 1987. Apple is a registered trademark of Apple Computer Inc. Macintosh is a trademark of Apple Computer Inc.

Orange Micro® Inc.

1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029 or (714) 779-2772 in CA

"Quality Apple® Enhancements since 1980"

Circle 575 on reader service card

Mac Charting Tools

Turn your Excel spreadsheets into something worth looking at: charts for presentation and persuasion

by Michael Alexander

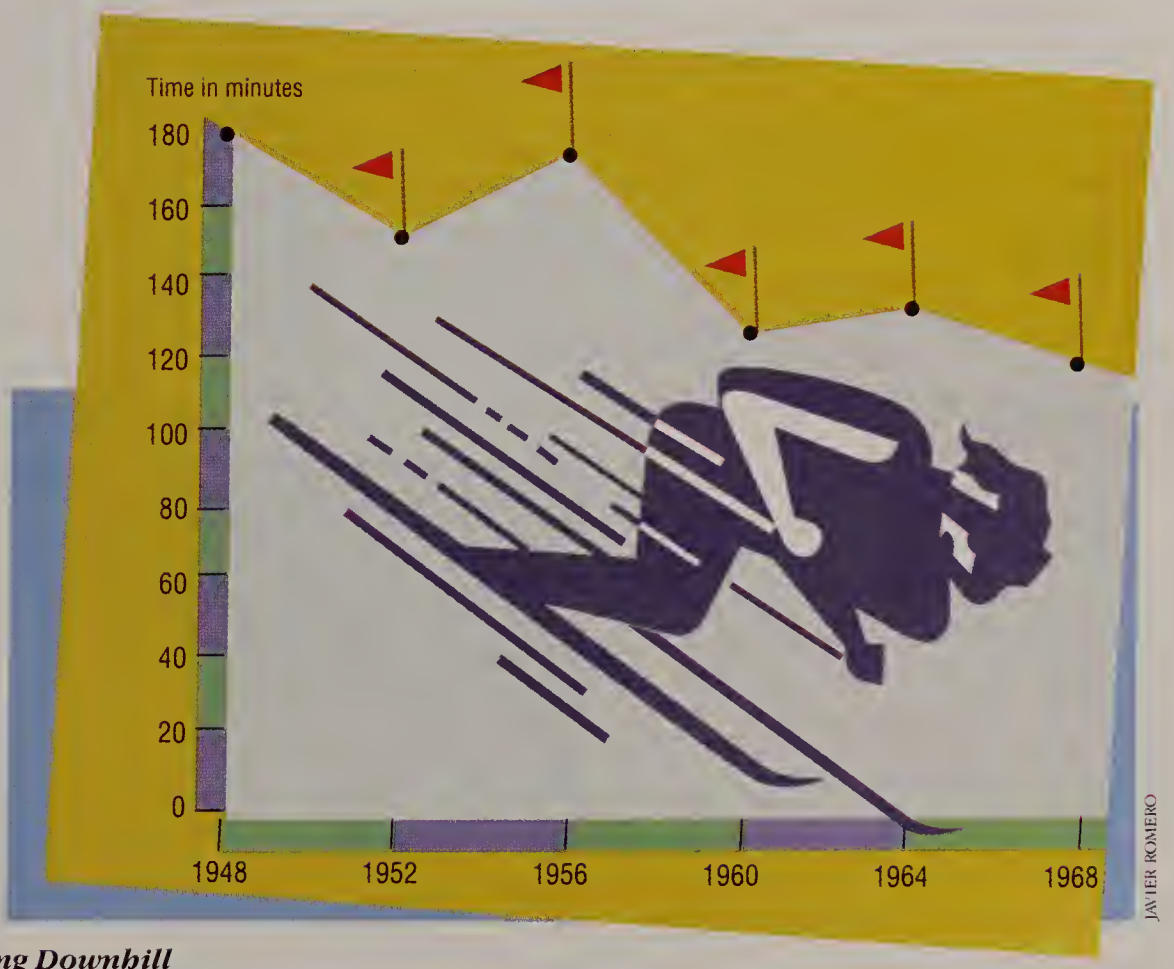
Look at the chart on this page. Now turn the page to see the table entitled "Downhill Ski Stats." They both say the same thing; the chart says it faster.

Charts and graphs are visual, and in this case a look is worth the 102 boring words I wrote–and discarded–that would have explained the trend in Olympic downhill skiing. A chart helps viewers quickly understand the relationships that series of numbers represent.

In business, numbers are for bean counters, trends and summaries are for decision makers. Corporate annual reports, the *Wall Street Journal,* and the weekly news magazines have long been filled with graphs (or charts, they're the same thing). Your local paper probably prints more graphs these days, thanks to the influence of *USA Today,* which discovered how much readers love the way graphs present information, and thanks to the Macintosh, which makes graphs easy for newspaper artists to produce.

The Mac also makes it easy for individuals to create their own charts and graphs, particularly with an integrated spreadsheet and graphing program like *Microsoft Excel.* According to Microsoft, more than 75 percent of *Excel* graphs created are used for presentations. If you use charts to persuade or inform others, this article can help you increase the power of your visual communications.

The following assumes that you've done some *Excel* graphing. If you haven't, you'll still be able to follow along, but you might also want to refer to the chart section of Douglas Cobb's *Excel in Business* (Microsoft Press, 1985), a good tutorial. Better yet, throw away Microsoft's often incomprehensible manual, and use Cobb's book for reference, too. For a quick decoder of *Excel* chart terminology, see "Chart Parts."



Racing Downhill
Winning times for Olympic skiers. From an Excel *graph, the artist created this vivid chart in* Adobe Illustrator.

One last thing before we begin: a bow to Nigel Holmes of *Time* magazine (see "A Chart Master's Advice"). Holmes is the acknowledged master of making statistics understandable and interesting, and his ideas are the foundation of this article. Some of his magic depends on graphics arts skills that are beyond the ability of most people in business, but Holmes's success stems primarily from an inventive mind, a ready wit, and clear analysis. You can apply the same qualities to your graphs.

Column, Line, and Pie

The type of chart you choose depends on the data you want to show. *Excel's* Gallery menu offers seven types of charts, but I will focus on three major categories.

■ *Column charts* Column charts show quantities. The height of each column represents the amount of data being

(continues)

FREE SONY VHS* TAPE!!!
with every 50 **SONY** boxed or 100 **SONY** bulk diskettes purchased from this ad.
*Sorry, BETA tape not available.

SONY
Boxed in tens

3½" SS .99 each, 100+
3½" DS 1.49 each, 100+

SONY MAC•PAC
Boxed in fifties

	50+	100+	400+
3½" SS	.95	.92	.87
3½" DS	1.24	1.17	1.14

Sony Labels 4¢ each, minimum 50

PageMaker
#1 Desktop Publishing Program

Flexible and easy to use.
Ideal for complex jobs requiring an innovative mix of graphics and text.

$399

GENUINE TEAK
3½" Disk Storage $15.95

MAC • MODEM
2400 BAUD EXTERNAL
- Hayes Compatible
- RS232C MAC Cable
- Communication software included.

$209

MAC BOTTOM
HARD DISK DRIVE
HD45 ..... $1234

TONER CARTRIDGES
Hewlett Packard, Cannon and Apple Laser Printers $89

APPLE
Imagewriter Ribbon
SOLD IN SIXES
Black 2.45
color 3.05
(Color 6-packs include one each red, green, yellow, blue and purple)

★ 7 to 7 Central ★ Saturdays 10 to 3 ★

COMARK/USA★FLEX
1-800-872-3539
For Technical Service Call 1-312-351-7172

TERMS: Minimum order $100. Shipping/handling additional. Visa, MasterCard and Prepaid orders accepted. Corporations rated 3A2 or better & government accounts are accepted on net 30 basis. C.O.D. orders under $500 add an additional $5.00 handling charge. C.O.D. orders over $500 add an additional $10.00 handling charge. All checks must be imprinted with buyer's name and address. We ship to the 50 states. APO, FPO, AK and HI orders add and additional 5% to the total order amount to cover all PAL and insurance. No sales tax outside of IL. All returns must have prior authorization from our Customer Service Department (1-312-351-9700). Unauthorized returns/refused shipments are subject to a 20% restocking charge. All prices and specifications are subject to change without notice.

135 N. Brandon Dr. Glendale Heights, Il 60139

Circle 134 on reader service card

Downhill Ski Stats

Year	Winning Time (in minutes)
1948	2:55.0
1952	2:30.8
1956	2:52.2
1960	2:06.0
1964	2:18.16
1968	1:59.85

These skiing statistics are the basis for the much more engaging chart on the previous page. Which way would you rather present increased productivity? Charts give dull numbers a lift.

counted. By comparing column heights for different products sold, for example, you can easily see the relationship of the quantities and tell which sold the most. That's why column charts are good for comparing quantities for a given time period. You can also use a column chart to show how the quantity of a single product changes over time, but do so when you want to emphasize the quantities themselves.

Bar charts are horizontal column charts, and they provide one advantage when you're working with *Excel* on the Macintosh. *Excel*'s plot area and the Macintosh screen are both horizontal. A simple and clean horizontal chart in *Excel* allows up to 15 products to be ranked, and there's more room for labels along the vertical category axis.

If you have too many bars, arrange products in small groups and plot those. Then make a summary chart of the groups. When you have lots of data points, consider a line graph.

■ *Line graphs* With a line graph, you can show trends as quantities change over time. Instead of emphasizing the quantities, line graphs highlight change. (The British call them fever charts; traditionally, the line graph has been used to track the rise and fall of temperature.)

(continues)

	A	B	C	D	E
18					
19		1984	1985	1986	1987
20	Kitty Nibbles	22.8	39.1	45.5	57.3
21	Cat Chow	36.7	38.9	40.2	45.3
22					

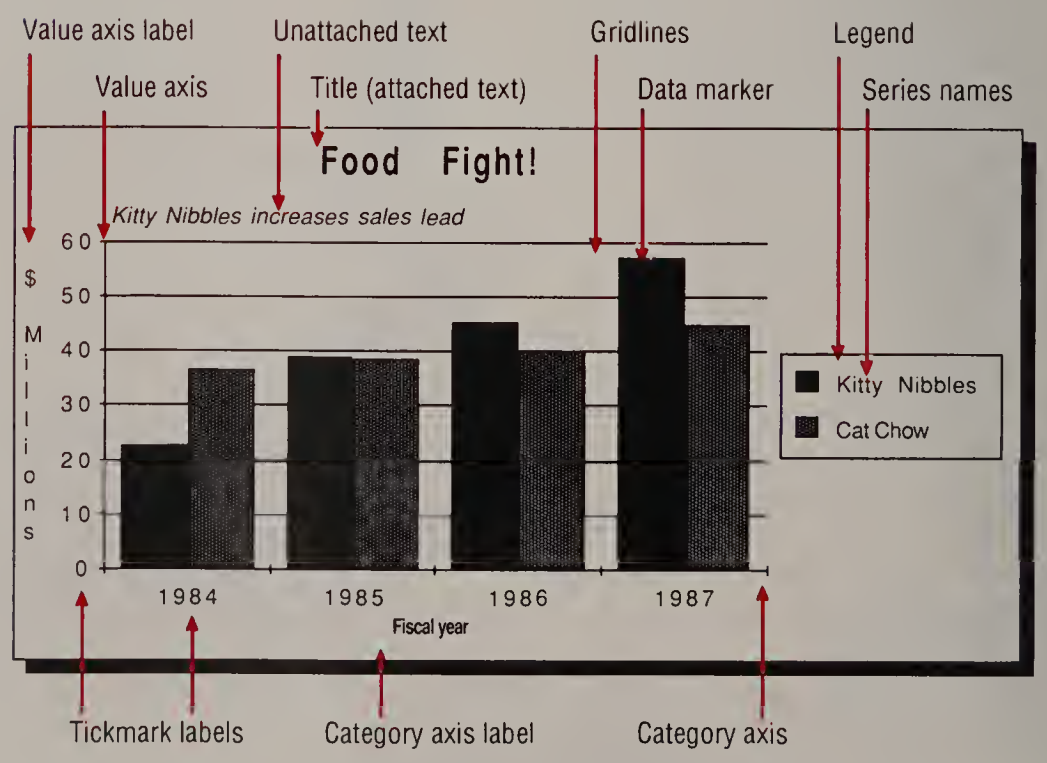
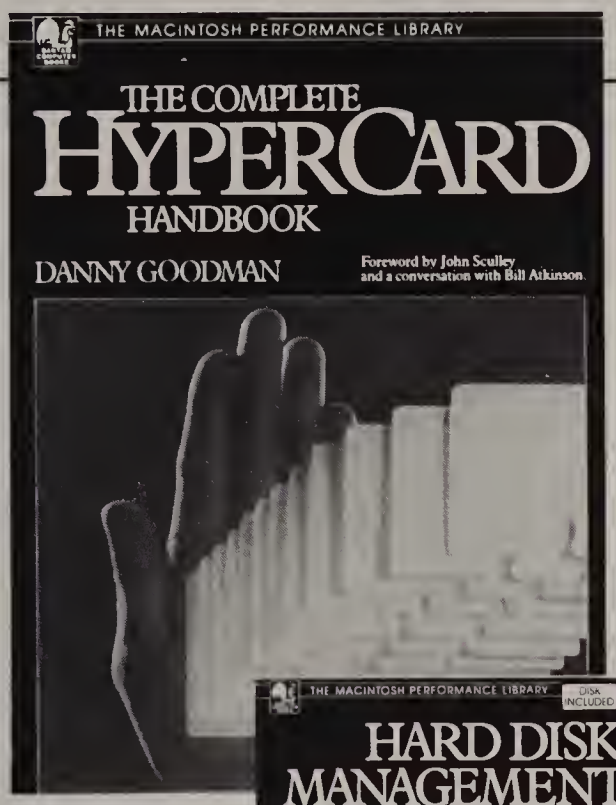


Chart Parts
Excel's spreadsheet-column labels become chart-category tickmark labels; the sales figures turn into chart columns. Data for a single variable, like all the sales for Kitty Nibbles, is called a data series.

Read only Macintosh—
Definitive books by experts you trust

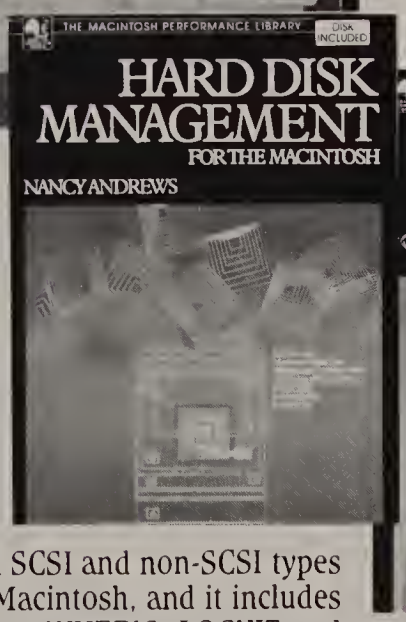


THE COMPLETE HYPERCARD HANDBOOK
By DANNY GOODMAN
Foreword by John Sculley
and a conversation with Bill Atkinson
The Macintosh Performance Library

"HyperCard is a four-dimensional blank slate.... In THE COMPLETE HYPERCARD HANDBOOK, I show you how to master the first three dimensions and how to unlock the fourth to build your Macintosh world around HyperCard."

—DANNY GOODMAN

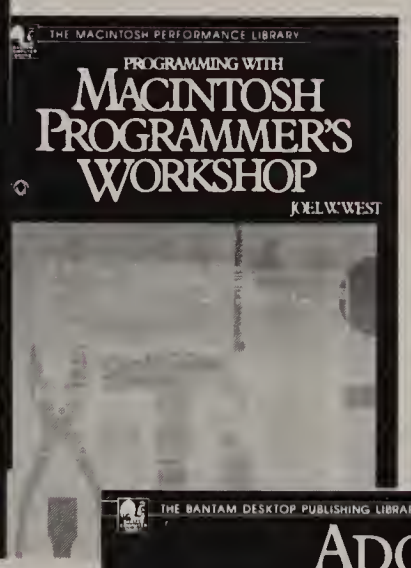
720 pages $29.95/$34.95 in Canada



HARD DISK MANAGEMENT FOR THE MACINTOSH
By NANCY ANDREWS
The Macintosh Performance Library

This book and disk package will show you how to optimally organize and manage hard disks. The book/disk covers both SCSI and non-SCSI types of hard disk drives for the Macintosh, and it includes three indispensable utilities: WHERIS, LOCKIT and BACKUP for creating another hard disk tape drive or 800K diskette.

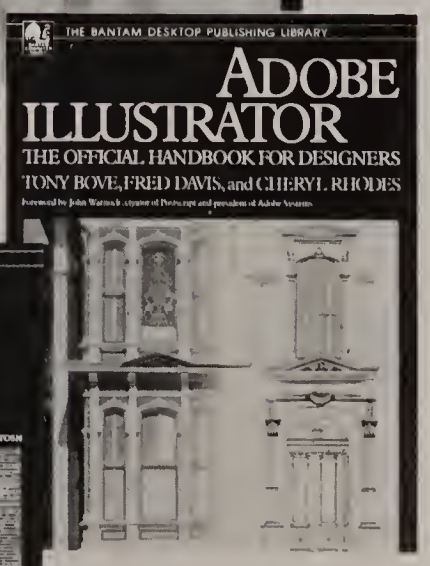
246 pages $34.95/$42.95 in Canada



PROGRAMMING WITH MACINTOSH PROGRAMMER'S WORKSHOP
By JOEL W. WEST
The Macintosh Performance Library

This book is a comprehensive guide to the Macintosh Programmer's Workshop and its capabilities, including using and programming the MPW Shell, developing programs with MPW Pascal and MPWC, and modifying and developing programs with MPW's tools. This is the one book that every Macintosh programmer should own.

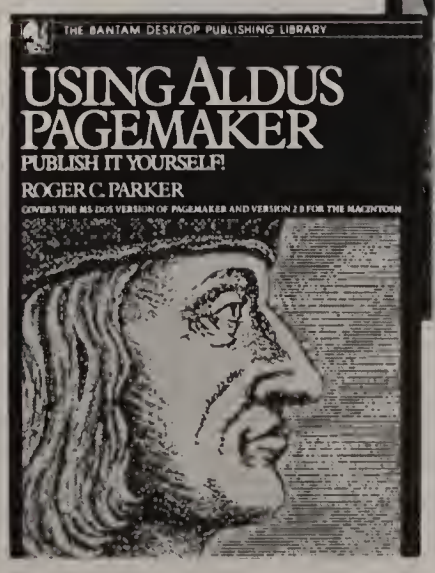
768 pages
$29.95/$34.95 in Canada



ADOBE ILLUSTRATOR
THE OFFICIAL HANDBOOK FOR DESIGNERS
By TONY BOVE, FRED DAVIS, and CHERYL RHODES
Foreword by John Warnock, creator of Postscript and president of Adobe Systems
The Bantam Desktop Library

Endorsed by Adobe Systems, this book is a treasury of techniques and tips for creating high-quality art on this state-of-the-art system

320 pages $21.95/$26.95 in Canada



USING ALDUS PAGEMAKER
Publish It Yourself!
By ROGER C. PARKER
The Bantam Desktop Library

This is a complete step-by-step guide to unleashing the full power of PageMaker, in both MS-DOS and Macintosh versions, to create magazine pages, book pages, ads, newsletters, technical reports, and other documents of professional quality.

370 pages
$19.95/$24.95 in Canada

BANTAM
COMPUTER
BOOKS

Circle 41 on reader service card

The time period goes on the horizontal (or category) axis, and quantities on the vertical (or value) axis. You may confuse readers if you flout this convention.

Each data series you plot produces a separate line. This is useful for comparing the trends of different products over the same time period, but rarely can a chart show more than four lines without confusion, particularly if the lines intersect.

■ *Pie charts* These are best for showing quantities as proportions of a whole. If you're dealing with percentages, consider the pie chart first. A pie represents just one data series; the slices are the data points. Avoid thinly sliced pies–more than eight slices are hard to label and read. It's possible to compare two pies if each has just a few wedges. For example, one pie could show the proportion of teenagers, young adults, middle-aged people, and the elderly in the American workforce in 1970; another could show those proportions in 1980.

As you can see, your data largely determines which of the three chart types will best present your data. With *Excel,* however, you can experiment a bit. The program's ability to create simple charts easily on screen allows you to switch quickly among different types of graphic representation. But before you create finished charts for presentation, take some time to analyze what data you want to graph–and to prepare your spreadsheet.

What's the Point?

Charts are for communicating. Ask yourself some questions to make sure you're on the right track before you prepare them.

Naturally you understand the chart, but will your audience? Will the chart draw attention to the most important information? Who will see the chart? Specialists, or just folks? Large group or small? Is the subject of the chart entirely new to your audience or are you updating material they know? How much time do you have to inform them?

What is the most important number, or numerical relationship, you want to convey? Once you pin that down, you know the message of your first chart. If you present other information on the same chart, will it obscure your main idea?

Consider whether your purpose is to inform your audience or to persuade them to take action. Then evaluate the tone of your presentation. Can you perk up interest by using catchy titles or subtitles? Should

(continues)

A Chart Master's Tips

Time magazine's Nigel Holmes says, "Whatever computer programs do to plot statistics, you have to do more to lodge them in peoples' brains."

Holmes adds a visual symbol that tells the readers what a chart is about. "Since you're doing a visual anyway, say visually what the numbers are about. If you're showing automobile sales, instead of a bar chart, make a car chart."

Chart Art

Not many business people have the graphics talent to create the kind of charts that Holmes advocates, and it would be hard to justify such effort and money for, say, a department planning session. But companies spend a lot of time and money on presentation visuals, and that's where graphic artists come in.

Holmes says show your *Excel* charts to the artist. "Then explain the point of the chart. The illustrator can help you make that point."

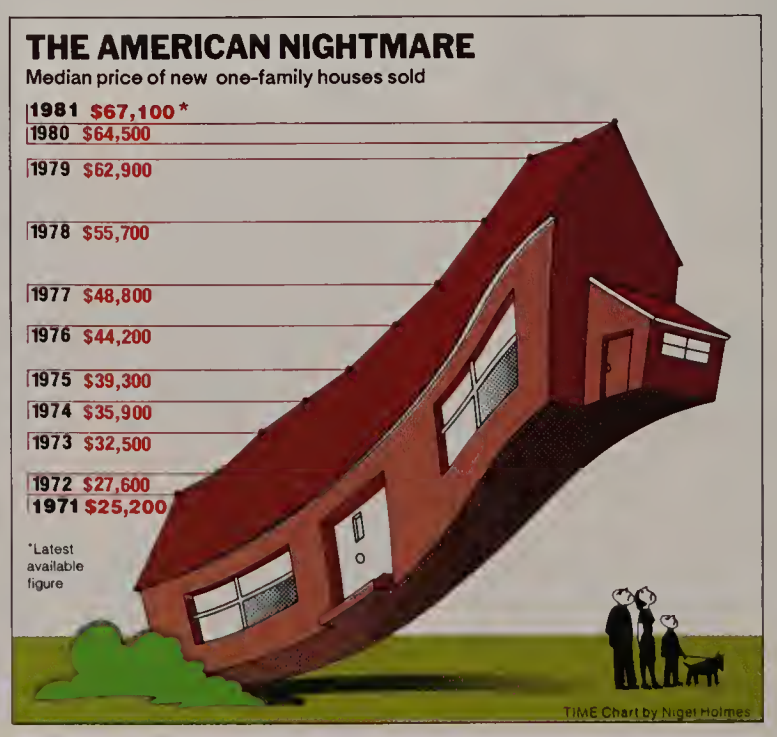
When Holmes came to *Time* in 1978, "charts were necessary evils." He turned them into one of the magazine's distinctive features, and himself into the magazine's executive art director. His charts are often funny and always imaginative. "But I'm not just dressing up the numbers," he cautions. "If the readers don't get the statistical information, the chart fails."

Presentation

Holmes's graphs are memorable, but he's also famous for his presentations to live audiences.

"Any presentation," he says, "is theater." He warns against showing long series of charts. Instead, he intersperses charts with photographs of the subject matter, and he changes the pace by turning off the visuals and just speaking.

In a recent talk at Stanford University, he projected a chart grid and used it as a background for a bar chart of helium-filled balloons on strings of different lengths. Oh, you prefer a line chart? Holmes whipped out a portable vacuum cleaner, blew up a 15-foot-long tubular balloon, and had a member of the audience hold it at a 30-degree angle as the graph line: sales were up. It brought the house down.



"Draw it again, Sam..."

Here's looking at . . .

Introducing "Draw It Again, Sam,"™ the newest drawing program for Macintosh?™ With powerful extended features, it adds new dimensions to your Mac graphics.

If you have used MacDraw™ or MacDraft,™ you've felt the power that a drawing program can put in your grasp. Imagine the same power brought to an even higher level, with features like libraries, layers, color, advanced text features, and a wide array of graphic display modes . . . Imagine "Draw It Again, Sam."

Libraries Were Never This Much Fun

Only "Draw It Again, Sam" lets you create your own graphics and text libraries. Create any image, simple or complex, and copy it into a library. Click on an icon-like symbol or on the image's name in a menu, and place the image anywhere on any drawing. Store and retrieve frequently used images, text, or logos, building large libraries (up to 500 images) for drafting, designing, or just for fun. No more rooting through scrapbook files, no more wrestling with the clipboard, and no more wasted time!

Create a Masterpiece —Layer by Layer

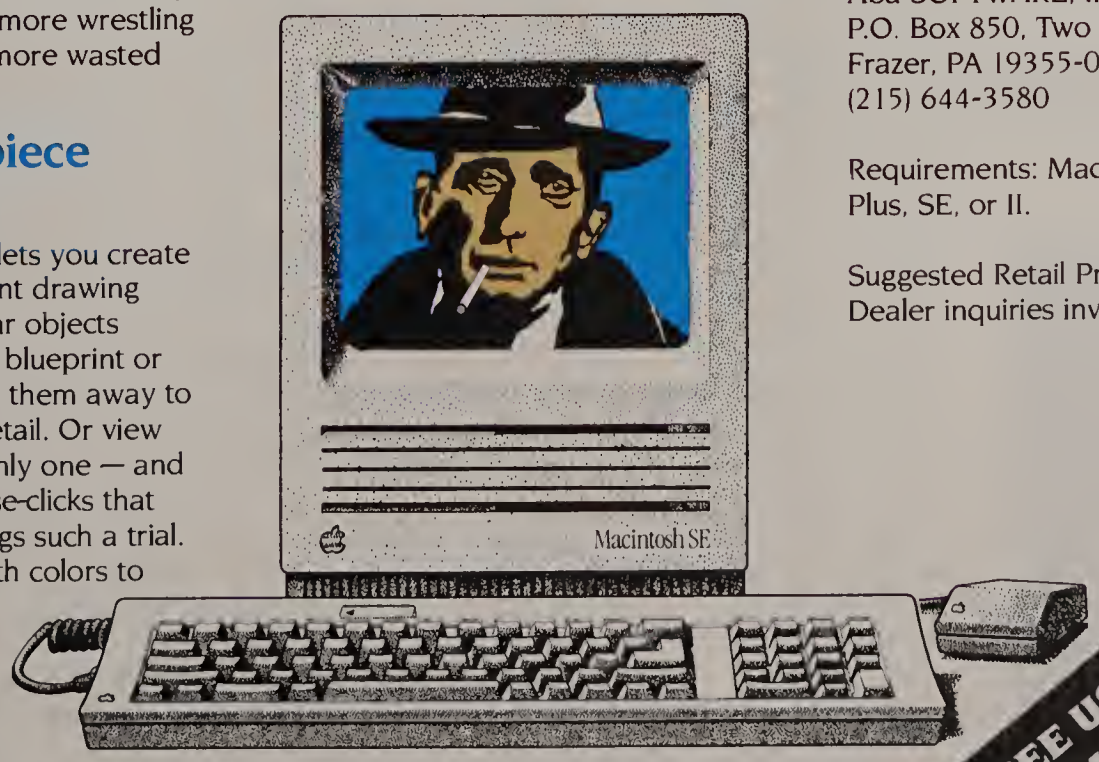
Only "Draw It Again, Sam" lets you create and use up to ten transparent drawing planes. You can group similar objects together, as an architectural blueprint or an anatomical drawing. Peel them away to reveal layer after layer of detail. Or view them all while working on only one — and avoid those accidental mouse-clicks that make doing detailed drawings such a trial. Use layers in conjunction with colors to produce spot color separations with ease or extend a single drawing into an animated series. You can even import a drawing and work over it or behind it without touching the original. Save or print the drawing layer-by-layer or as a whole. The possibilities are endless!

Amazing Graphic Flexibility Is Yours

"Draw It Again, Sam" uses the Macintosh's drawing modes to their fullest potential. Your objects can be in opaque, inverted, clear, or erased modes. You can experiment with overlaying transparent colors and patterns, you can even extend your drawing skills beyond the basics and generate an endless set of special effects. The countless colors and shapes achieved by this program are breathtaking.

To Paint or Not to Paint

Version 2.0 of "Draw It Again, Sam" adds a full set of painting tools to the drawing ones. Now you can combine the fine detail of bit-mapped graphics with the flexibility and ease of object-oriented drawing. And you can use both paint and drawing tools on the same layer — either side by side or overlapping. The best part is, "Draw It Again, Sam" is compatible with other paint, draw and page layout programs, allowing you to import and export art forms.



You Must Remember This . . .

With its comprehensive set of features and ease of use, this program is one you have to get your hands on. To find out more, or to order your copy, call (215) 644-3580 and say, "Draw It Again, Sam."

Call or write:

SOFTWARE

Aba SOFTWARE, Inc.
P.O. Box 850, Two Davis Avenue
Frazer, PA 19355-0915
(215) 644-3580

Requirements: Macintosh™ 512E, Plus, SE, or II.

Suggested Retail Price: $150
Dealer inquiries invited.

SEE US AT BOOTH #231
MACWORLD EXPO
SAN FRANCISCO

"Draw It Again, Sam" © copyright 1987 Aba Software. Inc. all rights reserved. MacDraw, QuickDraw and the Macintosh models are registered trademarks of Apple Computers. Inc. MacDraft is a registered trademark of Innovative Data Design. Inc.

Circle 212 on reader service card

Give your ears a workout

Whether you're a beginning student or a professional, you can benefit from ear training. With Listen 2.0 and your Mac, you can create an ear training program to suit your needs.

Listen 2.0

Interactive Ear Training Software for the Macintosh™

- Triads, 7th, 9th, 11th, and 13th chord exercises
- Inversions, intervals, simple and complex melodies
- On-screen piano and guitar
- Adjustable degree of difficulty
- Full Mac and MIDI compatibility

"A music educator's dream and a Mac musician's salvation."
-- Geary Yelton, **Electronic Musician**



$99

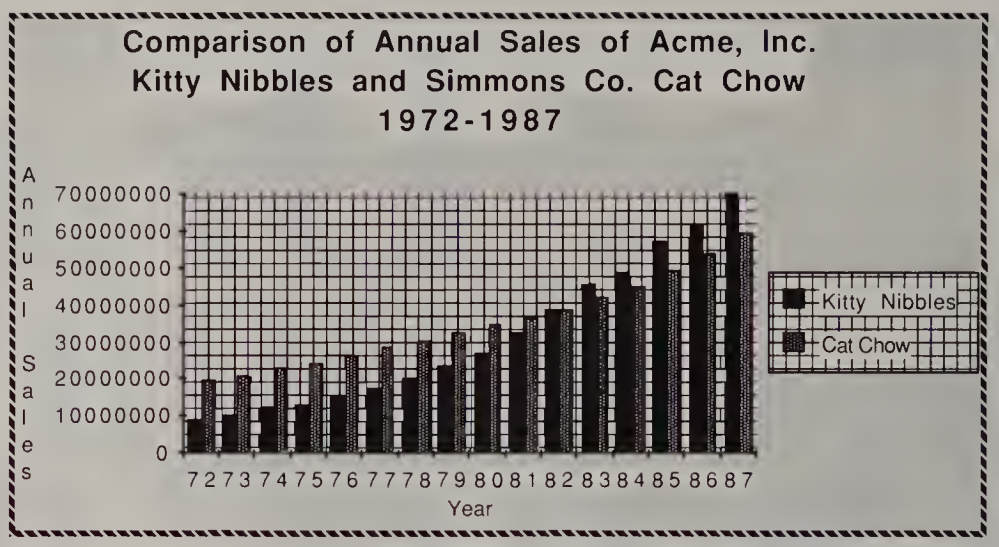
PO Box 996, Menlo Park, CA 94026
Check, money order, or MasterCard/Visa
Order by phone: **(415) 323-5022**

Circle 632 on reader service card

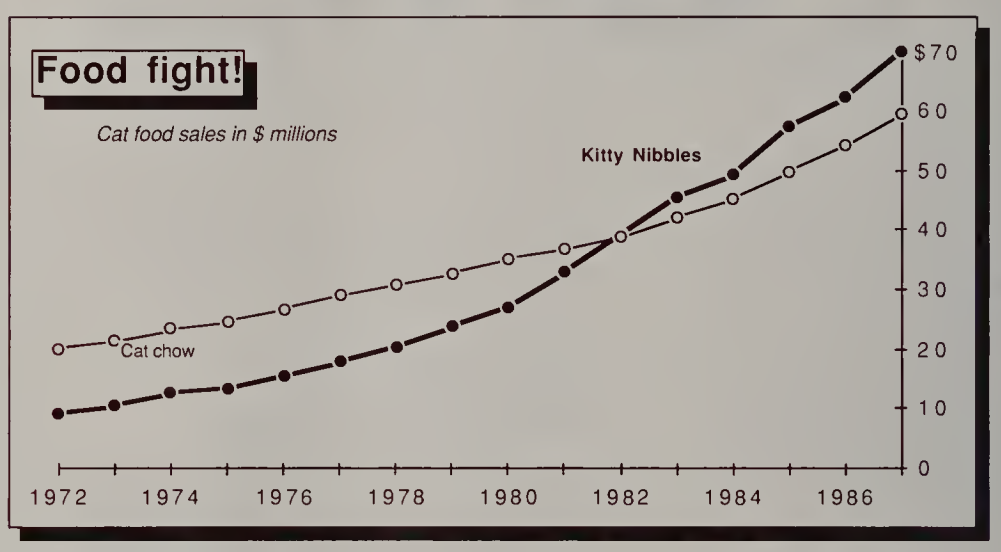
Having Problems With Your Subscription?

Please let us know.

Phone toll-free 800/525-0643. From Colorado, Alaska, Hawaii and outside the U.S., please phone 303/447-9330.



Good Grief
What's wrong with this picture? Nearly everything. This Excel *chart is lost in a mass of visual clutter, and there's no source for the data. Most important, the column-chart style emphasizes each year's sales revenues of the two products, instead of the trend over time.*



Source: Cat Demographics

Good Graph
Compared with "Good Grief," this Excel *chart simply and clearly shows the underdog brand overtaking the leading brand.*

the chart go to a graphic artist for embellishment?

Your answers will tell you what style of chart to use, what data to present, and how to present it. Once you've answered the questions, it's time to open your spreadsheet.

Lining Up the Numbers

Complete your spreadsheet design before creating any charts. If you change the *location* of cells in the chart selection, *Excel* may chart the new data incorrectly. Changing data within cells causes no problems, but if you must relocate cells, make a new chart–just to be safe.

The best format for a spreadsheet may not provide the best foundation for a chart. Spreadsheet labels may be too long. Cells or arrays you want to plot may be scattered across a worksheet. Cell formats get in the way of graphing. Blank lines that make the data more legible on the spreadsheet may create blank data series on a chart. Such discrepancies can cost you much time cutting, pasting, reformatting, and chasing around the spreadsheet. Instead, create a separate charting section on your spreadsheet with its cells linked to the main spreadsheet cells. Or create a separate worksheet linked to the main worksheet.

In the chart section of your worksheet, watch out for distracting trailing zeros in labels. Graphs are for summary, not for precise detail. When you chart numbers, such as the tickmark labels on the value axis, round them off so only the significant digits show. In the "Good Grief" example, all those zeros in the tickmark labels ($10,000,000 through $70,000,000) cause viewers' eyes to glaze over–and take up space you'd rather use for the graph. Round the numbers to 10 through 70 and note in the subhead that the values are millions, so viewers can digest the data more quickly (see "Good Graph").

Creating a Chart

To create a chart, select a continuous range of cells (containing data and labels) from the spreadsheet. Choose New from the File menu and double-click Chart in the dialog box. (The keyboard shortcut is ⌘- N, C, O. Don't bother waiting for the dialog box before pressing the letters.) *Excel* cuts and pastes the selected data into a default

(continues)

Graphic Artists...Creative Geniuses... and Aspiring Artists...

Win A $10,000 Mac II Package!

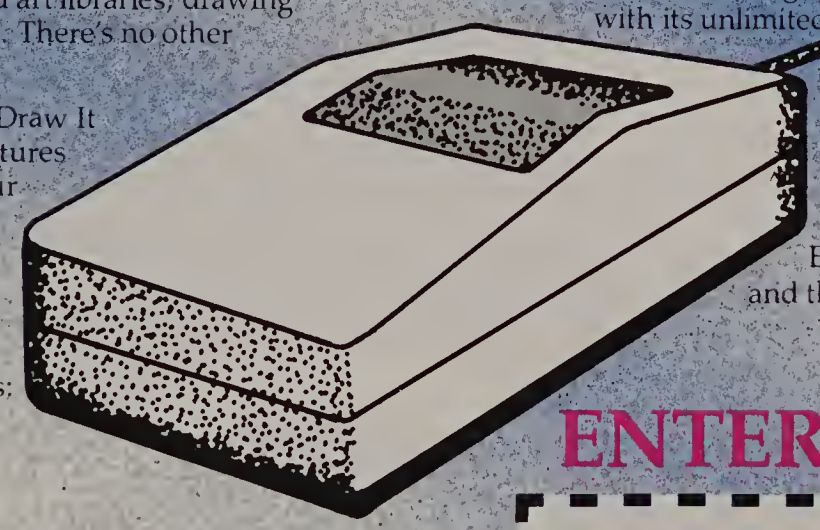


Announcing the "Draw It Again, Sam..." Graphic Arts Contest

If you've been waiting for your big break in graphics your time has finally come, thanks to Aba Software, the creators of "Draw It Again, Sam."

It's the only drawing program that gives you up to 10 layered drawing planes, limitless text and art libraries, drawing modes, and full paint capabilities. There's no other drawing program like it.

To enter, just take your copy of "Draw It Again, Sam," demonstrate its features the best way you can, and let your imagination go!



CATEGORIES

Submit your work of amateur or professional "graphic excellence" in any of the following categories: Commercial Art, Technical Art, and Fine Art.

PRIZES

Grand Prize
The best overall work will receive an Apple Macintosh II computer featuring a 40 megabyte hard disk, color monitor, two megabyte RAM, retail value over $10,000!

First Prizes
The best work from each of our three categories will be awarded an Apple Macintosh SE computer featuring a 20 megabyte hard disk, retail value over $3,500!

Best Amateur Artwork Prize
The best amateur work will be awarded the first prize Macintosh SE package outlined above.

Honorable Mentions
Bask in the limelight! Twelve runners up, selected from all categories, will have their work published, along with the other winners in the August '88 issue of a national "Mac" magazine.

RULES

All artwork must be produced with a registered copy of "Draw It Again, Sam" software. Entries are limited to one per person, per category. All artwork becomes the sole property of Aba Software, Inc. and contestants give up all rights and claims in connection with its unlimited use. All finished artwork must be received by May 7, 1988. **Entries will be reviewed by a panel of judges made up of industry leaders and artists.** A complete list of winners' names will be available from Aba Software, Inc. Winners will be notified in writing by June 15, 1988. Employees and Associates of Aba Software, Inc. and their families are not eligible for this contest.

ENTER TODAY!

YES, Enter my work in the "Draw It Again, Sam . . ." Graphic Arts Contest! Please print and fill out completely. Mail with your entry to: Aba Software, Inc., P.O. Box 850, Two Davis Avenue, Frazer, PA 19355-0915

Name _____

Address _____ Apt # _____

City _____ State _____ Zip _____

Home Phone _____

Business Phone _____ Ext _____

Category of entry: ☐ Amateur ☐ Professional
☐ Commercial Art ☐ Technical Art ☐ Fine Art

Title Of Work (s) _____

I fully understand that my artwork becomes the sole property of Aba Software, Inc. and that I relinquish all rights and claims in connection with its unlimited use.

Signature _____ Date _____

For more information, call or write:

SOFTWARE
Aba Software Inc.

P.O. Box 850, Two Davis Avenue
Frazer, PA 19355-0915
(215) 644-3580

"Draw It Again, Sam . . ." © copyright 1987 Aba Software, Inc. All rights reserved.
Macintosh II and SE are trademarks of Apple Computers, Inc.

Circle 18 on reader service card

"VAX-to-the-Macs" Specialists—*With A Respected Family Tree!*

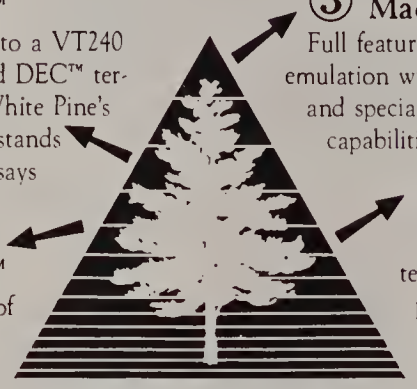
White Pine Software offers a complete family of products for total two-way Macintosh™/VAX™ communication: text, graphics, file transfers and program access.

① **Mac240™**
Turn your Mac into a VT240 with our acclaimed DEC™ terminal emulator. White Pine's "VT240 emulator stands among the best"—says Digital News.

② **Mac241™**
All the functions of Mac240 PLUS COLOR.

③ **Mac220™**
Full featured VT220™ emulation with expanded text and special character capabilities.

④ **VMacS™**
Share Macintosh text, data and program files among users.



WHITE PINE SOFTWARE

⑤ **Reggie™**—Convert MacPaint™, MacDraw™, and Clipboard™ images into ReGIS™ or SIXEL™ formats.

CALL (603) 886-9050
for your desktop communication solutions.

Mac240, VMacs, and Reggie are trademarks of White Pine Software, Inc., DEC, VT, VAX, are trademarks of Digital Equipment Corporation; MacDraw, MacPaint, and Clipboard are trademarks of Apple Computer, Inc.; Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 231 on reader service card

Prevent Macintosh Theft!

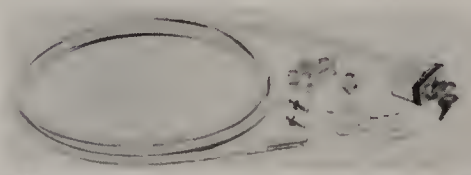


MacKablit System

Heavy duty 10' steel cable (7 x 19) secures and locks computer, printer, other equipment, up to 4 components. The unique MacKablit system incudes 2 brackets that snap into existing slots on the Macintosh keyboard and computer. Additional hardware included for other Mac peripherals (disk drive, printers). The unique MacKablit system utilizes existing security slots on the keyboard and computer and existing screws in other peripheral equipment. The system includes 2 brackets for the security slots plus unique Kablit fasteners for peripherals. Cable passes through Kablit fasteners, preventing removal of screws.

EXCLUSIVE!
Proprietary components (Pat. Pend.) permit only your key to release MacKablit. When ordering multiple units, specify locks to be keyed differently or alike. Specify Mac, Mac Plus SE, or Mac II.

Other Kablit systems for IBM, Apple, others.



$39.95 + $3.00 shipping/handling
Quantity pricing also available for multiple purchases from schools, institutions, businesses, industrials, etc. Send P O

Money back if returned in 30 days.
Phone or send check.

Secure-It, Inc.
10 Center Square
East Longmeadow, MA 01028
800-451-7592 413-525-7039
Dealer Inquiries Invited

Circle 184 on reader service card

column chart. Choose another of the 42 chart types from the Gallery menu, and *Excel* instantly redraws the data in that style. (For a quick review of *Excel* chart terminology, see "Chart Parts.")

If you have settled on a type of chart, make that the default. Select the type from the Gallery menu, then choose Set Preferred Format from the Chart menu. After that, no matter what chart type you're using, you can convert it to your preferred style by choosing Preferred from the Gallery menu.

Most people use the Gallery to select a chart type. That's fine. But if you add unattached text, patterns, special formatting, and other embellishments, you'll lose most of your custom settings when you switch chart types in Gallery. Instead, change the chart type by selecting Main Chart Type on the Chart menu.

What's the difference between making a Gallery selection and starting from Main Chart Type? The Main Chart Type and Main Chart commands give you control over the entire palette of *Excel*'s chart types. The Gallery offers you a limited selection—the most common types. You can be a painter who starts with a blank canvas, or one who paints by numbers.

Customizing Details

Once you have a chart type that will best display your data, you may want to change other preferences, too, such as sizing and typeface. Before you begin modifications, though, establish the finished size of the graph and resize the window accordingly. Click the zoom box of the window to view a screen-size chart instead of *Excel*'s little default size. Then resize to fit your finished layout. Otherwise you may waste a lot of time making refinements only to discover that all the category tickmarks overlap when you print smaller than the size you worked on.

Now, on to the fine points. Even experienced graphers often don't realize how much graphic control *Excel* offers. You can customize nearly every aspect of a chart by choosing Patterns or Text from the Format menu. Try it out by selecting an element, say the background or the border of the legend, selecting the appropriate command, and then experimenting with the options in the dialog box. As you explore, the *Excel* manual's miserably cryptic explanations of these features will begin to make sense.

(continues)

The VT600's resolution of six hundred dots per inch insures smooth curves and sharp detail both at large sizes and in small text–as shown in this block of eight-point copy.

See it in our fine print . . .

At 300 dpi, hairline strokes and delicate serifs–the hallmarks of certain typestyles–are either sacrificed or distorted. At small sizes, 300-dpi characters such as these begin to fill in. At large sizes, character edges can appear decidedly ragged.

. . . and in the quality of our smooth headlines and crisp illustrations. Until now, you've had to choose between the cost savings and convenience of plain-paper output and the high quality obtained from phototypesetting.

The VT600 eliminates the trade-offs. With an imaging resolution of 600 x 600 dots per inch, a VT600 produces camera-ready typeset text and graphics on plain paper, right in your office. Because VT600 images contain four times the information of 300 dpi output, all the subtleties of graphics and text are reproduced with exceptional fidelity. The VT600—a breakthrough for electronic publishing.



PostScript compatibilty—the VT600 plain-paper typesetter is plug-compatible with your existing front-end PostScript applications.

Up to 150 typestyles on disk—for increased system performance, flexibility and efficiency.

Up to 10 prints per minute can be generated by the VT600—as much as six times faster than other laser printers for certain applications.

Low cost per print—one-third the cost of phototypesetting.

The convenience of plain-paper imaging—immediate results without chemical processing.

Designed for the office—attractive packaging, silent operation, very small footprint.

For complete information call 800 631-8134; in New Jersey call 201 887-8000, ext 999.



The VT600 . . . advancing the state of the art of laser printers while preserving high aesthetic standards for type and graphics.

©1987 AM International, Inc
Varityper is a registered trademark, VT600 is a trademark of AM International, Inc. Line Art created with Adobe Illustrator. PostScript and Adobe Illustrator are trademarks of Adobe Systems Inc.

A division of AM International

Circle 48 on reader service card

Varityper

Lies, Statistics, and Graphs

Graphs lie. Better than raw numbers. Take a line graph, for example. Its most memorable feature is the slope of the line. A steep angle up means profit sharing for everyone. A steep angle down means look for a new job.

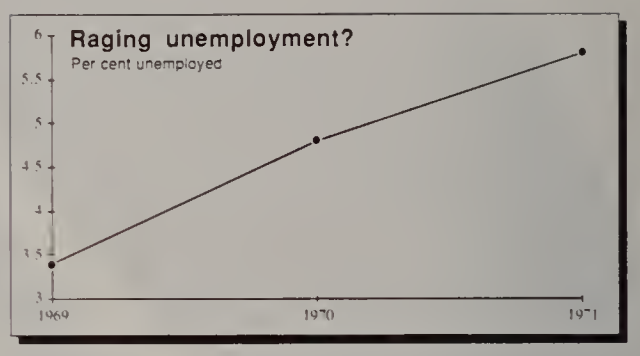
In truth, success or failure may be concealed by the graph's scale. When one axis represents time, slope can be correctly interpreted only by examining both scales.

From "Graph 1," it appears that unemployment was high in 1971. But was it? Not if you refer to "Graph 2." Uneven time series, as in "Graph 3," can produce equally misleading results. And of course, if you want to appear to say something while saying nothing, show a graph without a scale. There are dozens of ways to distort statistics with your graphs. A few traps you might fall into with *Excel* are listed here. For a whole book on the subject, consult Darrell Huff's *How to Lie with Statistics* (W.W. Norton, 1954).

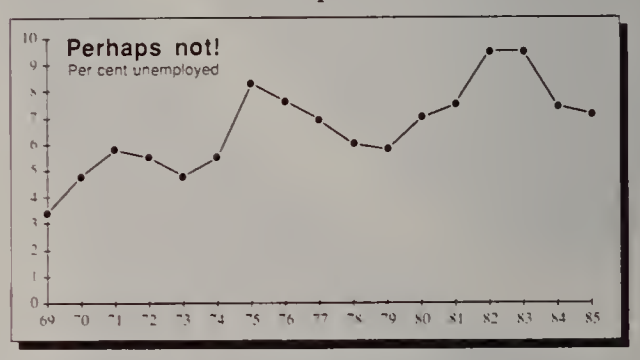
The stacked-line charts you can create with *Excel*'s Main Chart dialog box are nearly impossible for the reader to sort out; don't use them.

If you use symbols instead of oblongs in column or bar charts, watch for subtle distortion. A manufacturer that sells four times as many cars ought to show four more car symbols than the other maker, not one car symbol four times as big—that would make it 16 times greater by volume.

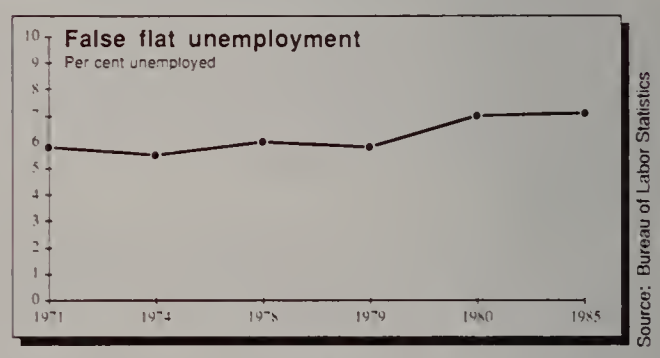
This recitation is not an exercise in moralizing, though graphic liars tend to be struck by particularly scenic lightning bolts. The worst data distortions are unintentional.



Graph 1



Graph 2



Graph 3

One thing you'll discover is that *Excel* can go pattern crazy. If your taste in clothes runs to plaid jackets worn with diagonally striped pants, paisley ties, and tie-dyed shirts, *Excel* offers the opportunity to express your visual sophistication. You set the background pattern by choosing Select Chart (or ⌘-A) from the Chart menu. I recommend sticking with the default Invisible. The other chart background patterns produce a jarring contrast with the white field that automatically appears under any type. Sure it's legible. It's also ugly.

Some background patterns may look OK in the plot area, as long as no text appears atop the pattern. Be careful of the grid pattern, though. It masquerades as the chart grid, but only on close examination will the viewer realize it's just a design whose lines don't have anything to do with the axes tickmarks. The horizontal-lines pattern is similarly misleading. If you need grid lines, choose Axes from the Chart menu, and click the boxes you want.

If you like a border around your chart, try adding a shadow border for a three-dimensional look.

Should you choose Text from the Format menu and click OK, *Excel* will change all text in the chart to whatever settings were selected. Do it by mistake, and all your carefully formatted text turns into Geneva 10. Undo-ably.

The Category Axis

Often the category tickmark labels don't fit comfortably on the axis. Abbreviate when you can—one- or three-letter abbreviations for months, for example—on the charting area of your spreadsheet. You've gone too far, however, if viewers don't instantly know what your shorthand represents.

To avoid overlapping names, label only every second or third tickmark. Select the category axis and choose Axis from the Format menu; then in the box, type the desired interval between labels. Typing a 2, for example, places a label on every other tickmark.

The category axis label often repeats the title, subtitle, or tickmark labels. Edit your wording; the world knows that 1986, 1987, and 1988 are years.

If a column chart lacks space for the

(continues)

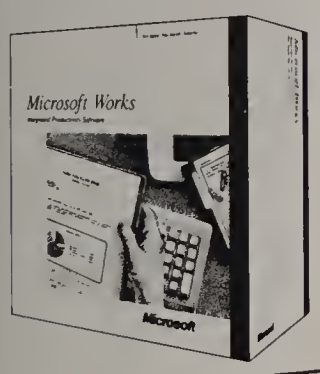
1-800 MAC-ONLY

telemart

Doing Business Since 1980 A Division of CW Marketing, Inc.

FEDERAL EXPRESS
FREE
AIR EXPRESS SHIPPING

No Charge for Federal Express
No Charge for VISA or MasterCard
No Additional Charge



Microsoft Works

168.00 Shipped Federal Express

Microsoft® Works makes it easy to get started with your Macintosh™ system, because it has all the computing tools you need, all in one place. So you can write. Organize information. Analyze numbers. Chart your results. Communicate with other computers. All from a single program. All easier than ever before.



Microsoft Excel

218.00 Shipped Federal Express

Nothing helps you analyze and work with numbers better than Microsoft® Excel for Apple® Macintosh™ systems.

It's the most formidable spreadsheet ever to run on a personal computer. With extraordinary business graphics and a built-in database, it's the most powerful spreadsheet available on any personal computer.

Microsoft Word

218.00 Shipped Federal Express

No other personal computer word processing program lets you take a document from start to finish with the speed and ease of new Microsoft Word for Apple® Macintosh™ systems.

Display and editing speed is impressive. And Word's wealth of features make creating and revising documents fast and easy. Features like integrated outlining, integrated style sheets, page preview, and spelling corrector.



Microsoft and the Microsoft logo are registered trade marks of Microsoft Corporation. Apple is a registered trademark and Macintosh is a trademark of Apple Computer, Inc.

Power Point ..... **$218.00** Shipped Federal Express

Flight Simulator ..... **$32.00** Shipped Federal Express

Mailing Address: 8804 N. 23rd Avenue/Phoenix, Arizona 85021

- To Place an Order: 1-800-622-6659
- To Follow Up on an Order: (602) 944-1037 10a.m.-3p.m. Mon.-Fri.
- Order Line Hours: Mon-Fri. /a.m.-6p.m. Saturday 9a.m.-1p.m
- Alaska Orders: Call (602) 944-0402

- **No Charge for VISA and Mastercard**
- All product carries a manufacturer's warrantee. All Guarantees, rebates, trial period privileges & promotional programs are handled by the manufacturer only

- No APO, FPO, or international orders, please
- **Call before submitting P.O.'s Ask for National Accounts**
- Personal and Company Checks Will Delay Shipping 3 weeks
- Prices, Terms & Availability Subject to Change Without Notice
- **We Do Not Guarantee Machine Compatibility**

ircle 398 on reader service card

category tickmark labels, try switching to a bar chart. Even in bar charts, keep the category labels short so the text doesn't dominate your visual message.

The Value Axis

Excel places the value axis on the left of the chart. *Time* magazine's Nigel Holmes argues that it often more naturally belongs on the right, because our eyes usually go to the most recent data first. To put the value axis on the right, click on the category axis, and choose Axis from the Format menu. Click Value Axis Crosses at Maximum Category and click OK.

Try not to label the value axis. If the label is horizontal, it seriously reduces the space left for the plot area. If the label is vertical, it's ugly and nearly impossible to read.

If the data cells on your spreadsheet are in dollar format, all the value tickmark labels will show dollar signs before them. Avoid the visual clutter by using a plain format, such as 0, #,##0, or 0.00, on the spreadsheet. Later, when you tidy up your chart before final printing, create a dollar sign in unattached text, and drag it to the top of the value axis.

When *Excel* creates a graph, it determines the scale by the maximum and minimum values of the data. More often than not, *Excel* makes a good choice, but it often plots values from a starting point greater than zero. This can make data plots look more volatile than they would look in a historical context.

Deciding whether to start the axis from a point other than zero is a very difficult judgment call, and Holmes says he's becoming increasingly conservative on this issue. He cautions not to abandon zero unless the bottom of the data range is high and the variation among data points is small. An example would be a graph of the weekly Dow Jones industrial average, which (at press time) starts around 2000 points and typically varies by only 100 points even on a bad day. Plot that from zero, and the variations disappear.

To redraw a graph using zero as the minimum value, select the value axis, choose Axis from the Format menu, double-click the value in the Minimum box, type 0 (zero), and click OK. If you prefer *Excel*'s original plot, return to the Axis dialog box and click the Automatic box next to Minimum. Of course, you can choose another minimum value and change the maximum value, too.

When you're showing a series of charts, viewers naturally assume that the scale remains the same through the series. That's a good reason to start all charts from zero. But doing that may excessively flatten the differences between some of the data series. An alternative is to start the value axis at zero, then add a symbol that interrupts the axis to show that the scale jumps to higher values (see "Custom Axis"). It would be nice if *Excel* would do this on command (Hey, Microsoft! How about in version 2.0?), but you can make one yourself.

Create the interruption indicator just before you print the chart because it will be unattached text. Select the value axis and choose Axis from the Format menu. Change the Minimum Value to a slightly lower number; that lowers where the category axis crosses, leaving room for you to set the zero. Click on a blank area of the chart to be sure no other part is selected. Type two spaces and press Enter. In the center of your chart you will see a blank area surrounded by little black boxes. (If it's sitting on top of an important data point, don't worry.) Choose Patterns from the Format menu and click on the last background pattern, left diagonal stripes; the pattern fills the blank area. Drag the little box onto the value axis, just above where it crosses the category axis. You can alter the size of the pattern by dragging its handles. Adjust its size and position until it appears to break the value axis.

Click again on a blank area, type a 0 (zero) and press Enter. The 0 appears in the center of your chart. Choose Patterns from the Format menu, select the white background pattern, and click OK. Now drag the 0 to cover the bottom tickmark label on the value axis. (The white background hides the old label.) To fine-tune the placement, choose Text from the Format menu. If the value axis is on the left of the chart, click the Right button under Horizontal Alignment. Or vice versa. You might also want to choose Bold and/or a larger type face for emphasis; then click OK. Adjust the size as needed using the handles.

Titillating Titles

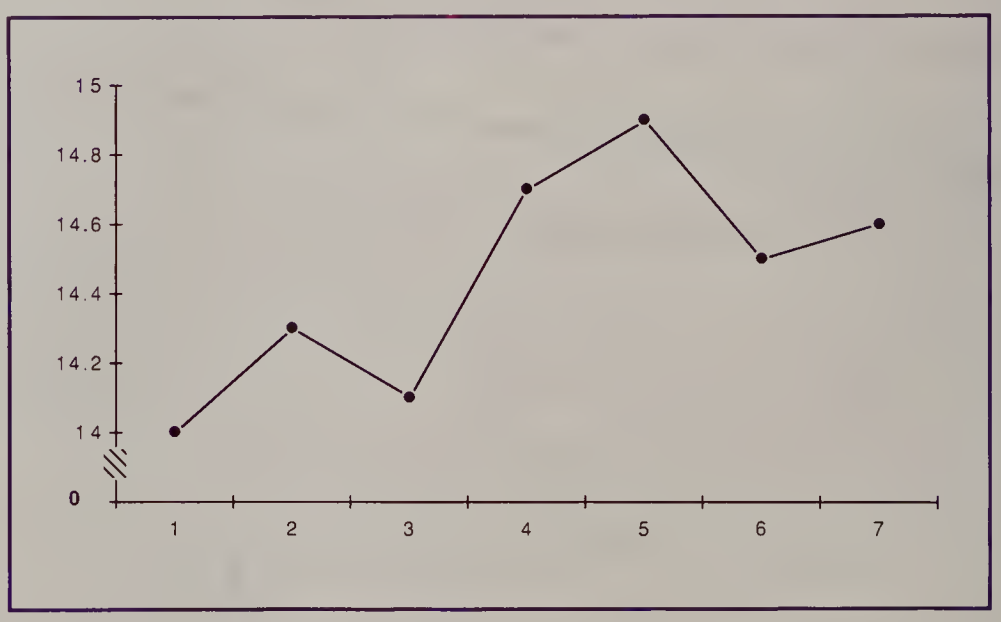
Keep titles short. One line is best. A three-line title is always too long. The title can simply identify the subject: "1986 Sales." Or it can reinforce your point: "1986 Sales up 52%."

Either way, the title should focus on your graph's message. Keep out extraneous material, like the boss's name. You may think you're making points, but it's a distraction to your audience. If you must include such embellishments, keep them away from the visuals–perhaps at the top or bottom of the page or transparency.

When you create a title using Attached Text from the Chart menu, *Excel* always centers it over the plot area. If you then choose Text on the Format menu, the Horizontal Alignment buttons control how a multiline title is justified. Create an off-center title from unattached text. Since an Attached Text title compresses the plot area, creating the title from unattached text may give your graph more headroom.

Once you've got a snappy, attention-grabbing title, you can use a subtitle to explain vital but mundane items like the units of measurement (millions of dollars, price per 100,000 units, volume in metric tons). That's better than crowding the value axis with a label.

(continues)



Custom Axis
If you can't plot data from zero, mock up an interruption to the value axis. Use unattached text to produce both the diagonal-line patch and the zero; then drag them into place.

Drive a Hard bargain

"You can easily fall in love with the quiet Jasmine drive... (It) ran flawlessly during the review period, with very good performance and no compatibility problems of any kind." – *MacWorld, July 1987*

"This drive is a pleasure to use. With a 26 msec average access time, it is one of the fastest drives around... It almost makes you feel young again."
Howard Bornstein – The MACazine, October 1987

"Even though the Jasmine 80 is inexpensive, we could find no compromise in quality or features with this product." – *InfoWorld, June 29, 1987 (Overall Review Rating: 8.5)*

"The Jasmine Direct Drive 80 is an excellent value, offering not only outstanding price and performance, but an excellent price against the small disk market as well. *InfoWorld* highly recommends looking at this drive for your Macintosh." – *InfoWorld, June 29, 1987*



80MB $1399
($1441.00 Visa/MasterCard)

50MB $1159
($1193.00 Visa/MasterCard)

An unbeatable combination of quality, performance and price.

The acclaimed Jasmine Direct Drive 80 is the standard by which all others are judged. Powered by the incredible Quantum 80 MB hard disk drive, it has become one of the most desired Macintosh peripherals ever made. And, like all Jasmine products, a long list of "extras" come along for the ride. For the same performance in a 50 megabyte capacity, be sure to check out the Direct Drive 50, also powered by Quantum.

Remember that Jasmine saves you 40% or more. To order call (415) 621-4339. VISA MasterCard

Jasmine Technologies, Inc.
555 De Haro Street, San Francisco, CA 94107

Our prices include a Full One Year Warranty. Every drive is shipped with a technical hotline number to answer any questions. Direct Drive 50, Direct Drive 80, Jasmine are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Apple is a registered trademark of, and Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 605 on reader service card

A Legend in Its Time–and Place

Excel lets you create a chart legend with a single click. Once your category labels are correct, just select Add Legend from the Chart menu. A legend box appears to the right of the chart, but that's not the best place, because the plot area squeezes left to make room for the legend. In the case of column graphs, that might force columns to narrow down to an illegible size. Positioning the legend across the bottom of the chart may take less room. Choose Legend from the Format menu and click the Bottom option.

But even out of the way at the bottom, a legend is usually not the best way to identify data series. To read the chart you first must look at the line or bar or pie-wedge that interests you, then note its pattern or marker, find its match in the legend box, read the label, and finally look again at the line or bar or pie-wedge you've now identified in order to glean its information. That's not a quick read. For multiseries column charts, legends are OK. For other types, I prefer to label the data plot directly.

You can create such labels from unattached text. Click in a blank area so you don't select a chart element by mistake. Type the label text (keep it short) and press Enter. Point inside the boxed area and drag the text. Place a horizontal label on the steep part of a line so it won't cover nearby data markers. If you're labeling several lines, try to place the labels in a neat stack or row.

You can add a pattern swatch keyed to the legend label and move them together anywhere you want. Create the swatch the same way you made the indicator for a broken value axis. Use the appropriate pattern and surround it with a thin black border. If you're manic enough, you'll eventually create a custom legend, one element at a time. Because all of this is unattached text, produce it just before you print the chart.

Bring the Point Home

Excel's chart palette gives you powerful techniques for emphasizing key information in your graph.

■ *Line weight* When making a line graph, *Excel* normally gives each line the same thin weight. Try using the medium or heavy weight on single-line graphs–or for the most important line in a multiline graph. Select the line, choose Patterns

(continues)

A Special Way to Paste

When *Excel* plots a chart, the top row and the first column of the spreadsheet selection have special meaning. If they contain text entries, the program turns them into category tickmark labels or series names. But what happens when your data is in rows and the label row also contains numbers? Numbers like 1982, 1983, 1984–which you mean to be category tickmark labels. The way *Excel* interprets them depends on the top-left cell in the selection.

If that cell is blank, *Excel* treats the top row of numbers as tickmark labels, just as you intend. But if the top-left cell contains an entry, either text or numbers, *Excel* plots the top row as a data series, producing a chart like Product Sales Chart 1 in "Paste Successful." The entry in the top-left cell is usually something extraneous, like *Year*. Erase it, and the data will plot correctly, as in Product Sales Chart 2.

Another way to create charts gives you total control over labels and data. Select a range on the spreadsheet, look at it carefully, and answer three questions.

■ Are the data arranged in rows or columns? (Hint: When you plot more than one data series, you have data in both rows and columns. Which is the right arrangement? Imagine that the chart you want to create is a line graph. Which cells do you want to link as a line? Are they in a row or a column?)

■ Are there labels in the first column of the selection?

■ Are there labels in the top row?

Next, copy your spreadsheet selection and open the new chart.

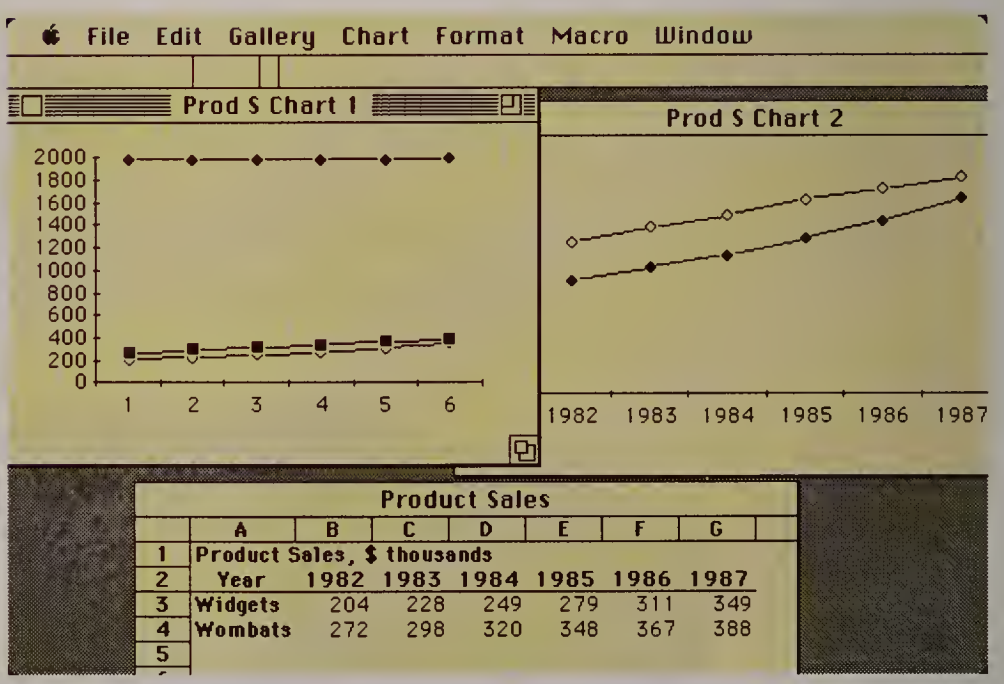
Choose Paste Special from the Edit menu. If the choices in the resulting dialog box confuse you, just refer to your answers:

■ If your data are arranged in rows, click Values in Rows. If in columns, click Values in Columns.

■ Check First Column if there are labels in the first column of your selection.

■ If there are labels in the top row of your selection, check Top Row.

That's it. Click OK, and your data should plot correctly.



SOFTWARE

BUSINESS & PRODUCTIVITY

Aegis Development
Doug Clapp Word Tools $44.95
Affinity
Tempo $54.00
Aldus
Pagemaker ..... $CALL
Ann Arbor
Full Paint $59.95
Fullwrite Professional $179.00
Ashton-Tate
dBase Mac $329.00
Batteries Included
Battery Pack $27.00
Disk Tools Plus $39.95
Thunder 1.1 ..... $29.00
Berkeley Systems
Stepping Out $59.95
Blyth Software
Omnis 3+ w/Express $359.00

BORLAND

Eureka $127.00
Reflex $59.00
Reflex Plus $159.00
Sidekick 2.0 ..... $59.00
Turbo Pascal $62.00
Central Point
Copy II Mac $24.00
Chang Labs
C.A.T. $189.00
Rags to Riches III 3 pak $287.00
Cricket Software
Cricket Draw $159.95
Cricket Graph $129.95
Device Driver ..... $CALL
Presents $299.00
Statworks $79.95
Data Tailor
Trapeze $169.95
Dataviz
Mac Link+ w/cable $129.00
Deneba
Canvas $119.00
Coach $64.00
Coach Thesaurus $39.00
Dubl-click
Calculator construction set $59.00
Wet Paint vols 1 & 2 ..... $49.95
World Class Fonts Bundle $49.95
Foundation Publishing
Comic Strip Factory $62.00
Layered
Front Desk $74.95
Letraset
Image Studio $299.00
Ready Set Go 4.0 ..... $279.95
Living Videotext
More 1.1 ..... $149.00
Macromind
Video Works II $129.00
Macropac
101 Macros $42.95
Mainstay
VIP $89.00
Translator to C for VIP $67.00

Microsoft

Basic $87.00
Chart $72.00
Excel $219.00
File $109.00
Fortran $167.00
Multiplan $105.00
Powerpoint $259.00
Word $229.00
Works $169.00
Write ..... $CALL
Mindworks Software
Mindwrite ..... $CALL
Monogram
Dollars & Sense $89.00
Nashoba Systems
Filemaker Plus ..... $CALL
Odesta
Double Helix II $429.00
Oldavai Software
DA Switcher $34.00
Icon-It! $49.00
Post Art $49.00

PCS
Versaterm Pro $194.00
Versaterm $69.00
Satori
Bulk Mailer $109.00
Bulk Mailer + ... $199.00
Legal Billing $329.00
Time Billing $389.00
Silicon Beach Software
Silicon Press $44.95
Super Paint $89.95
Super 3D ..... $CALL
Software Ventures
Microphone 1.1 ..... $115.00
Springboard
Certificate Maker $29.95
Supermac
Sentinel $89.00
Target Software
Scoop $289.00
Think Technologies
InBox $229.00
T/Maker
Click Art/Any Vol $31.95
Write Now $99.00
Word Perfect Corporation
Word Perfect $269.00

GAMES & EDUCATIONAL

Avalon Hill
MacPro Football $29.95
Broderbund
Ancient Art of War $31.95
The Toy Shop $39.95
Print Shop $49.95
Bullseye
Ferrari Grand Prix $44.00
Fokker Triplane $44.00
Davidson & Associates
Math Blaster $37.00
Speed Reader II $49.00

ELECTRONIC ARTS™

Autoduel $33.95
Chessmaster 2000 ..... $29.95
OGRE ..... $CALL
Patton vs Rommel $26.95
Pinball Constr. $26.95
Scrabble ..... $CALL
Sky Fox $26.95
Starfleet 1 ..... $CALL
Ultima III $39.95
Ultima III Cluebook ..... $ 9.95

EPYX

Sub Battle Simulator $24.00
Microsoft
Flight Simulator $32.95
Mindscape
Balance of Power $30.00
Crossword Magic $32.95
Deja Vu $29.00
King of Chicago $37.95
SAT $45.00
Uninvited $36.95
P.C.A.I.
Mac Golf $39.95
MacRaquetball $34.95
Silicon Beach
Airborne $19.95
Dark Castle $29.95
Enchanted Scepter $22.00
World Builder $47.95
Simon & Schuster
Typing Tutor IV $42.95
Sphere Inc.
GATO $28.00
Orbiter $34.95
Falcon ..... $CALL

HARDWARE

APPLE
Macintosh Computers ..... CALL
Laserwriter ..... FOR
Imagewriter ..... PRICING

MODEMS
Everex
2400 Baud,
100% Hayes Compatible ..... $CALL
Migent
300/1200 Baud,
100% Hayes Compatible
Pocket Modem $167.95

Mouse Systems
A+ Mouse ..... $CALL

DRIVES
Ehman Engineering
800K External Drive $189.00

Swan
TECHNOLOGIES
800K External Drive
$169.00

Softstyle
Macenhancer $149.00
Thunderware
Thunderscan $189.00

ACCESSORIES

Blohard
MACFAN $79.95
Ergotron
Mouse Cleaner $14.95
MacTilt $69.00
MacTilt SE $69.00
I/O Design
MAC+ Bag $69.95
Macintosh SE Bag $79.95
Imagewriter Bag $49.95
Imagewriter II Bag $54.95
Kensington
A-B Box $59.00
Control Center $59.00

Drive Cleaning Kit $21.95
Filter $29.00
Mouse cleaning kit & pocket $16.00
Mouse Pocket $8.95
Mouseway $9.95
Surge Supressor $32.00
System Saver $62.00
Tilt/Swivel $62.00
Turbo Mouse $77.00

MAC CABLES
$Call for Price & Configurations

Summi
Imagewriter Ribbons $5.95

EDUCATIONAL & CORPORATE ACCOUNTS:
We offer a full line of services catering to your needs.
To reach our Educational & Sales Department
Call 1-800-533-1131
Inside PA
Call 814-234-2236

DISKS per box of 10

3 1/2"	1-4	5-9	10+
SONY			
SS/DD	12.45	11.95	11.45
DD/DD	16.95	16.45	15.95
MAXELL			
SS/DD	11.95	11.45	10.95
DD/DD	17.95	17.45	16.95
VERBATIM			
SS/DD	14.45	13 95	13.45
DD/DD	18 95	18.45	17.95

OPEN: 8:00AM - 9:00PM Mon - Fri, 10:00AM - 6:00PM Sat, 12:00PM - 8:00PM Sun East Coast Time

DON'T SETTLE FOR LESS...

tcp SHIPS IT



Software orders over $50 & Accessories/Peripherals under 8 pounds will be shipped FEDERAL EXPRESS

(Yes even at these prices). You only pay TCP's standard shipping charge of $4.00 per order. Orders arriving before 1:00 PM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground for FREE.

MAC BOTTOM



HD21 SCSI $799.00
HD20 Serial Version $829.00
HD32 ..... $969.00
HD45 SCSI $1199.00
Call For Pricing on Modem Options

Logic Array
ProApp 20S $669.00
ProApp 40S ..... $CALL

MIRROR TECHNOLOGIES
Magnet 30X $869.00
Magnet 40X $995.00

Microsoft
EXCEL $219.00
WORD V3.01 ..... $229.00
WORKS $169.00
WRITE ..... $CALL

BERING
A MOUNTAIN COMPUTER, INC. COMPANY



NEW LOWER PRICES!
SINGLE 20 MEG
Removable Bernoulli - SCSI ... $1299.00
DOUBLE 20 MEG
Removable Bernoulli - SCSI ... $1999.00

cricket software
PRESENTS ... $299.00
GRAPH $119.95
STATWORKS $74.95
DEVICE DRIVER $CALL

SUPERMAC SOFTWARE
Sentinel $89.00
Super Spool $47.00
Super Laser Spool $89.00
Diskfit $47.00

Other Brands of HD's in Stock
If a product you want is not advertised, please call - it might be in stock

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear.
Shipping: $4.00 for software and accessories/ $10.00 for printers and color monitors/ $8 00 for disk drives and other monitors/ Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI.
Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.
All products include factory warranty.
ALL SALES ARE FINAL Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

VISA MasterCard

TOLL FREE 1-800-468-9044

Information and PA Orders 814-234-2236 Telex: 910 250 4239

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

Circle 483 on reader service card

from the Format menu, click on the line weight you want, and click OK. You can also use a gray pattern to make it less important, but forget the striped, diagonal, or crosshatched patterns. Even *Excel*'s thickest line weight is too thin to display them clearly.

You can shade the space between the category axis and the plot line of a one-line graph (to turn it into an area chart). It's an effective technique, especially if you choose a light fill pattern.

■ *Column charts* Use a heavy border around the most important column in a series.

■ *Pie charts* With *Excel,* you can drag one or more slices slightly out of a pie chart to draw attention to them.

■ *Plotting by Number* Help the viewer analyze the data by arranging the bars from longest to shortest, or vice versa. *Excel* ordinarily arranges data series in the order you paste them. You could carefully paste the series together one bar at a time to obtain a smooth sequence, but if you later change the spreadsheet data, the bar lengths may return to disorderly random lengths. It's easier to paste data series all at once and then change their order if necessary.

To change the plot order, click on a data bar in your chart and note the lengthy series formula that appears in the formula bar below the *Excel* menu. It looks intimidating, but you can ignore everything except the last number. If it's the number 1, that data series is the first one plotted on the chart. If you change the number to 3, *Excel* will replot the chart accordingly and automatically renumber the plot numbers in the other series formulas. By clicking on each data series and changing its plot number, you can turn a jumble into a smooth series.

You can use the same technique to change the order of wedges in a pie chart.

Percentage Charts

Pie charts let you show one percentage; you can put two pies side by side to compare percentages. But to compare three or more data series by percentages, use the 100% stacked chart type that *Excel* offers (type 5 in the Column or Bar gallery). *Excel* doesn't limit the number of patterned segments that stack up to 100 percent, but you might want to exercise restraint. The readers must estimate the percents for most of the stacked segments, so don't overwhelm them with lots of little pieces. Usually three or four data series are plenty for this type of chart.

■ *Printing* When printing on the ImageWriter, your results will usually be more crisp if you select Tall Adjusted from the Page Setup dialog box. If you create test charts on an ImageWriter but plan to make final copies on a LaserWriter, build in some time for making adjustments after you switch printers.

Making a Hit Series

Keep your charts simple—try to present only one idea or one comparison. You can use the chart form, the title, the typefaces, and other design elements to emphasize that one idea. Then use other charts to make other points.

When you create a series of charts, keep the following design elements consistent: typeface, type size, and weight; title locations; axis labels and locations; bar shading and other patterns. Change design elements only to emphasize the point of the new chart.

(continues)



LIFE LINE.

You've put a lot of money into your Apple system. And what's more, it's provided you with the power to be your best. Power you can't afford to lose.

Protect Your Investment.
For just a few dollars you can have the extra assurance that your equipment will be there when you need it. The Grimes Universal Security Kit has been thoroughly evaluated by Apple Computer, Inc. and carries an excellent overall rating. We are an approved Apple manufacturer of peripheral hardware and accessories. So you know the security system will fit like a glove. It plugs right into your Apple making it virtually theft-free and "borrow-free."

It won't matter if they take your calculator, your phone system, or your entire office. As long as the real power... your Apple Computer System, is still there, you're open for business.

A 24-hour security guard for $44.95.
Pick up a Grimes Universal Security Kit at your local Apple Dealer today. Or call Grimes for a dealer near you.

GRIMES

115 S. Arovista Circle, Brea, CA 92621 714/671-3931 • FAX 714/671-1426

Grimes continues to expand! If you're a manufacturer's representative, contact the sales department at (714) 671-3931 for opportunities marketing the Grimes Universal Security Kit or other Grimes products in your area.

Circle 123 on reader service card

The Microtech Super Stars

NOVA 20/30/50

High Performance Power ..... *for less*
Superior Speed ..... *for less*
Quality and Reliability ..... *for less*

Macintosh Plus and Macintosh SE Compatible
512K Compatible with the Microtech SCSI Port (call for pricing)

NOVA 20	**$599**
NOVA 30	**$729**
NOVA 50	**$999**

All Nova SCSI hard disk drives come preformatted and ready for use. Now available in the original Mac color or new platinum color.



MICRO MAC 30/45

Introducing the Micro MAC 30 and 45 now as Internal Hard Disks for the Macintosh SE

You can't beat Micro MAC's Quiet, High Speed, State of the Art Technology, now even more subtle than ever hidden internally inside your Macintosh SE. The unique "Micro Lock" head locking feature, a step beyond auto-park, allows you to maintain your Mac SEs portability without risk. Installation is quick and easy.

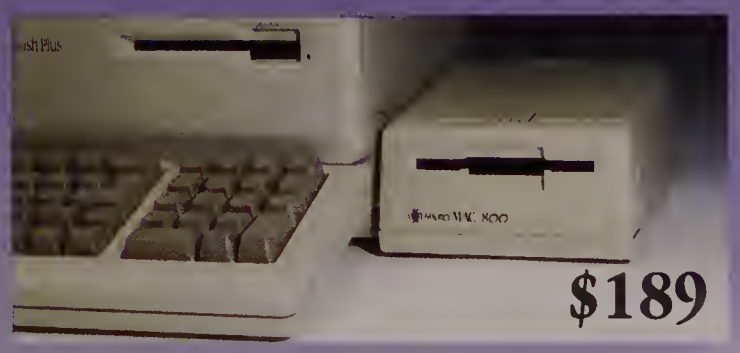
MICRO MAC 30	**$689**
MICRO MAC 45	**$899**

Additional savings with 800K trade-in

MICRO MAC 800

The First 800K Floppy Disk Drive Introduced for the Macintosh Computer
Quiet, Versatile, Dependable

128K, 512K, and Macintosh Plus Compatible



$189

MICROTECH MEMORY EXPANSION KITS

One Megabyte SIM Modules
In DIPS and Surface Mount Technology

For the Macintosh Plus and Macintosh SE Computer

2.5MB KIT	**$599**
4.0MB KIT	**$1159**

Prices subject to change

800-325-1895 In Conn.: 203-488-8993
Dealers call: 800-626-4276

MICROTECH PERIPHERALS, INC.

29 Business Park Drive/Branford, CT USA 06405

Micro MAC, Micro Lock, and Nova are trademarks of Microtech International, Inc.
Macintosh is a trademark of Apple Computer, Inc.

MICROTECH EXTRAS

ONE YEAR WARRANTY *on all drives*
TECHNICAL SUPPORT *call TOLL FREE*
FREE SHIPPING *UPS ground in Continental U.S. at no inflated cost*

Circle 470 on reader service card

If you are creating a series of similar charts, you can save a lot of time by creating a generic chart with all the style attributes of the series. Say you are creating a series of ten charts, and want each to be a column chart with 24-point Helvetica Bold titles in shadow boxes, 12 point Helvetica Italic axis tickmark labels, and a legend below the category axis. You only have to set those style attributes once. Create the first chart. Choose Column from the Gallery menu, and click your chart style.

To set the title style, choose Attach Text from the Chart menu. The radio button for Attach to Chart Title is already selected, so just click OK. Now choose Text from the Format menu and click Helvetica, 12 point, Bold, Border Shadow, and OK. Notice that you have not typed a chart title.

Select the category axis, choose Text from the Format menu, click Helvetica 12 point and OK. Follow the same procedure to set the attributes for the value-axis tickmark labels. Repeat the procedure to create a dummy value-axis label. Choose Add Legend from the Chart menu.

Now the good part. Choose Set Preferred Format from the Chart menu. All your formatting attributes apply to any chart based on any worksheet you create before you quit *Excel*.

But, you'll notice, none of the charts have titles. True. Select the first chart. Choose Attach Text from the Chart menu, click OK, type the title and press Enter. The title appears in 24-point Helvetica Bold, surrounded by a shadow box. Why didn't you type it originally? Because it would have become part of the Preferred Format, and would be the title of every chart you make from worksheets created this session.

Presentation

OK, so you've limited each chart to presenting one idea, and now you have 50 graphs that all look alike, except for the titles and the jiggle of the lines. Resist the temptation to introduce variety by changing half the title typefaces from Times to Helvetica Bold. Instead, throw 40 of the graphs away.

But, you protest, that stuff is important! Ever notice how, after you've spent a few hours in a museum, all the masterpieces begin to look alike? Your audience will react the same way—the more masterpieces you show them, the less they'll see and remember.

Nigel Holmes suggests animating graphs to hold your audience's interest in live presentations. If you are showing line graphs on an overhead projector, you can emphasize a line by tracing it with a colored marker.

Or you can have *Excel* only plot a line's data points, and then connect them yourself as you talk. To do this, select the line by clicking it. Its ends will be highlighted by small circles. Choose Patterns from the Format menu. Click the Invisible button. *Excel* displays only the markers for that data series. If you click the Apply to All box, none of the lines will be displayed. Print the chart, take a minute at the copy machine to turn it into an overhead, grab a fat colored marking pen, and you're ready to wow 'em.

A final word of advice. The most common charting mistake is trying to cram too much information onto a single graph. Charts are good for comparing a few categories of data, or for showing one category. If the charting area on your spreadsheet has a lot of columns *and* a lot of rows, watch out. You're probably better off making a table of figures. And that, of course, you can do with *Excel*'s spreadsheet. □

See *Where to Buy* for product details.

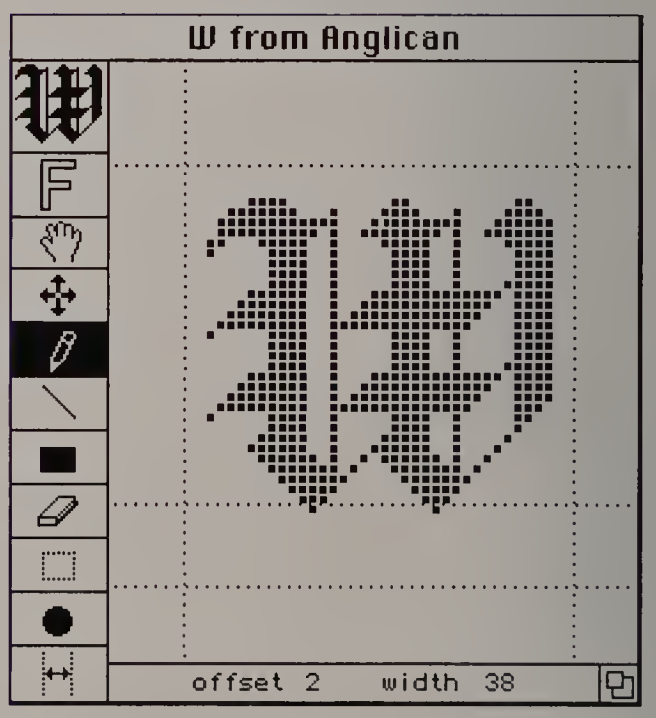
The Best Bitmap Font Editor.

Imagine gaining absolute control over your letters, documents, reports, and pictures, by customizing the actual printed letters themselves. Create unique individual characters never seen before. Call these characters up with the stroke of a key. Size them precisely and repeatably up to 127 points high.

With FONTastic Plus, all this will become second nature to you. FONTastic Plus gives you unlimited access to every Macintosh™ bitmap font. And the power to make as many new fonts as you can imagine. Text fonts, display fonts, symbol fonts, logos or foreign language fonts are all as simple as clicking the mouse.

Fatbits editing like MacPaint™—but with three sizes of fatbits—makes it easy to create and modify characters. Use cut and paste to copy common letter parts from one character to another. Background and guideline layers help maintain a consistent look from letter to letter. An integrated font mover makes installing fonts as easy as cut and paste. Instant print samples let you see how the font looks in print, without having to install it and type a sample.

FONTastic Plus is the next step in font editing. Fast, powerful, easy to use, and only $79.95.



FONTASTIC™ PLUS

ALTSYS CORPORATION

720 Avenue F, Suite 108
Plano, Texas 75074 (214) 424-4888

Circle 227 on reader service card

Publish!

The How-to Magazine of Desktop Publishing

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

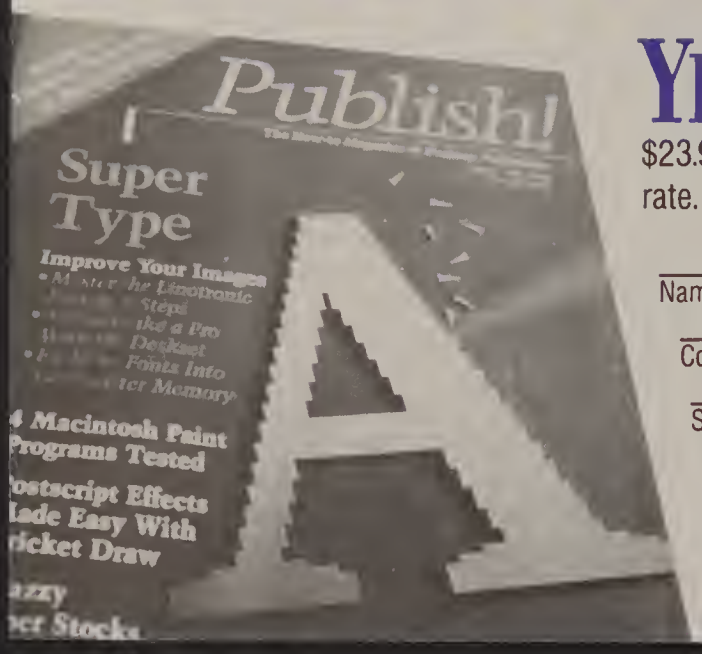
POSTAGE WILL BE PAID BY ADDRESSEE

Publish!
Subscription Department
P.O. Box 51966
Boulder, Colorado 80321-1966

SAVE 40%!

PREFERRED SUBSCRIBER SAVINGS

SAVE 40% IF YOU SUBSCRIBE NOW



YES! Send me one year (12 monthly issues) of *Publish!* at the Introductory rate of only $23.95. That's nearly 40% OFF the basic subscription rate. ☐ Payment enclosed ☐ Bill me later

Name (Please print your full name)

Company

Street

City State Zip

By regular subscription, ***Publish!*** is $39.90 for 12 issues. Offer available to new subscribers in the U.S. only. Please allow 6—8 weeks for delivery of your first issue.

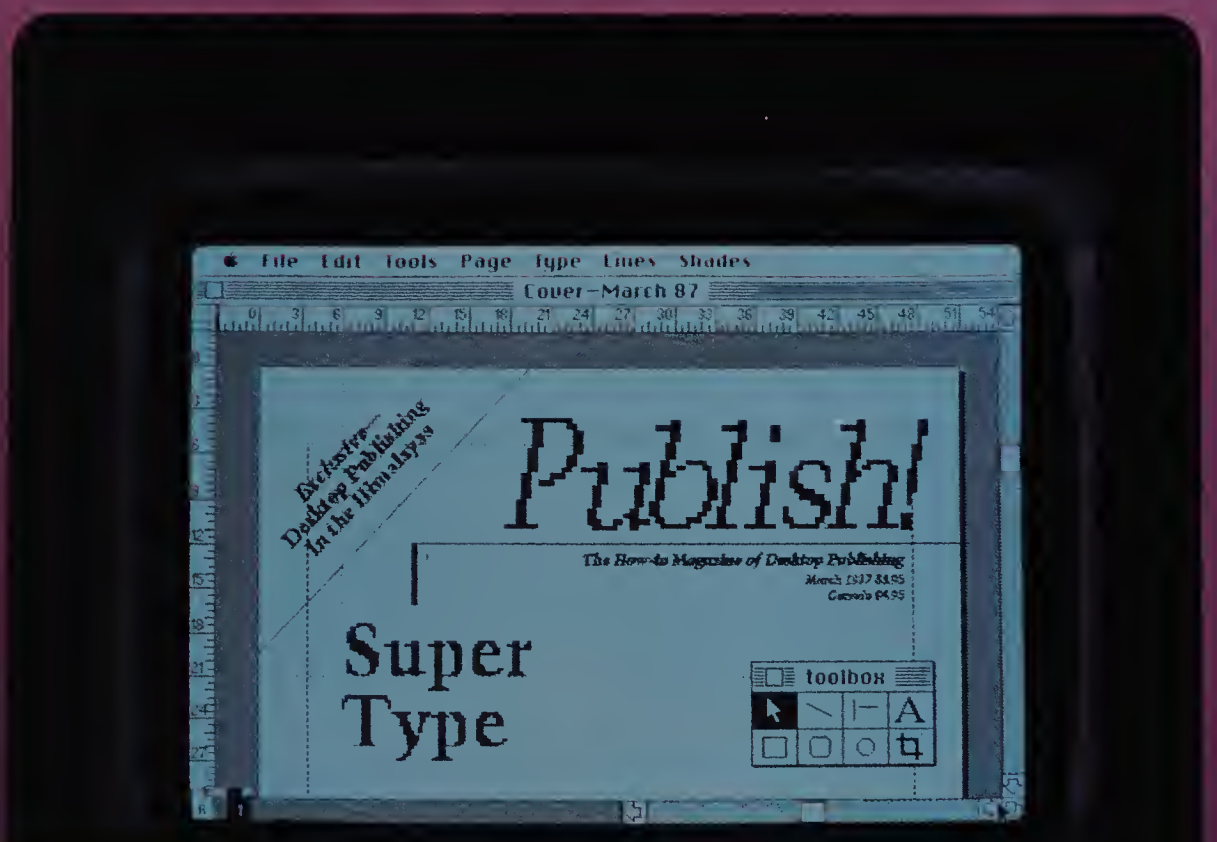
5CAA6

BE A PREFERRED SUBSCRIBER AND SAVE!

Use the postpaid card or call TOLL-FREE 800/222-2990

VISA and MasterCard accepted

WHAT YOU SEE IS WHAT YOU GET



Exclusive—
esktop Publishing
In the Himalayas

Publish!

The How-to Magazine of Desktop Publishing

March 1987 $3.95
Canada $4.95

Super Type

Improve Your Images
Master the Linotronic
Link in 6 Steps
Typeset Like a Pro
With PC Deskset
Fit More Fonts Into
Laserwriter Memory

Macintosh Paint
ograms Tested

tscript Effects
de Easy With
cket Draw

Subscribe Now and Save 40%

Become a Charter Publish! Subscriber and Here's What You'll Get—

***Reviews**—The largest selection of software and hardware product reviews available in any desktop publishing magazine.*

***Product News**—Information on the latest technology for all your desktop publishing applications. Hundreds of new product listings.*

***Solutions**—Step-by-step instructions that find answers to all your publishing needs.*

***Applications**—Tips on the fundamentals of graphic design and publishing basics.*

***Design Features**—Well known designers provide creative ideas and concepts for page makeovers.*

All this and more is yours in Publish! every month when you subscribe today at the Special Low Charter Subscription Rate.

Back to Basics.
Thousands sold at $525.
NOW just $199!

FOR THE BEST SELLING ACCOUNTING SOFTWARE LOOK FOR THE PEACHTREE LABEL

Peachtree Software®

Get Back to Basics™

Peachtree's Back to Basics is the most popular accounting system on the market today. And it's no wonder why.

Back to Basics is simple to install, easy to use, and priced in line with what small businesses can afford.

But don't take our word for it. Software Digest, a leading consumer organization, rated Back to Basics number one in overall usability when compared to products costing as much as $995 and, for the past two years, Back to Basics has won the *A + Magazine* ***Software of the Year Award*** for Macintosh business accounting systems thanks to the votes of over 20,000 Apple users.

No Experience Required

Back to Basics assumes you're an expert in only one business—your own.

- Installation of Back to Basics is painless — read only seven pages in the manual and *spend 30 minutes* using our screen menus.
- If you need to brush up on your accounting, use our accounting primer and tutorial, written by Harvard Business School Professor, Robert N. Anthony, plus our business section on how to handle everyday accounting dilemmas.

$199

Back to Basics Accounting System became a best seller priced at $525. Now, as a result of reduced expenses, we are able to offer all three modules — General Ledger, Accounts Receivable and Accounts Payable — in a complete set for just $199.

Proven Power

Peachtree has long been the first name in accounting software and the powerful features we've included in Back to Basics prove we understand what you're looking for.

- Complete integration of General Ledger with Accounts Receivable and Accounts Payable.
- Single transaction entries up to $999,999.99 and year-to-date totals up to $21,000,000.
- Journals and reports updated as each transaction is recorded.
- Void transaction facility automatically creates reversing entry.
- *More than 30 reports* can be viewed on screen or printed.

Macintosh Specific

Back to Basics was written specifically for the Apple Macintosh, not simply converted from another computer version. It uses the Macintosh interface (mouse and visual icons) for system operation and groups functions into on-screen "file drawers" for organization and ease of use.

Back to Basics was a featured accounting system in Apple's initial ads for the Macintosh and is backed by Peachtree's outstanding support, labeled by *InfoWorld* as "the finest in the industry". Support is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

Money Back Guarantee

When you purchase Back to Basics directly from Peachtree Software you're protected with a 30-day, money back guarantee (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded. For full details, call the toll-free telephone number below.

Invoicing Coming Soon

Back to Basics Invoicing will soon be available for the Apple Macintosh at an introductory price of $95.

Hardware Specifications

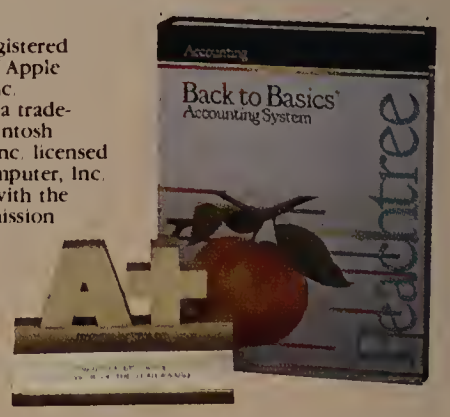
- IBM Personal Computer, PC/XT, PC/AT with two floppy disk drives or one floppy disk drive and a hard disk.
- Apple II +, IIe, IIc, IIgs with 128K and two disk drives or hard disk.
- Apple Macintosh 512K or Plus with two disk drives or hard disk.

Features That Made Back to Basics A Best Seller

GENERAL LEDGER
- On-line help displays Chart of Accounts.
- MTD and YTD show on income statements.
- Allows automatic Journal entries
- Check processing and printing capability through Cash Disbursements
- Optional cost of sales ranges.
- User modifiable Chart of Accounts included.
- Allows up to 3 checking accounts.
- Up to 10 departments with separate income statements

ACCOUNTS RECEIVABLE
- Calculates receivables on balance forward basis.
- Prints statements and matling labels
- Allows automatic posting to General Ledger.
- Accepts partial payments
- Calculates finance charges.
- Up-to-date customer information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Verifies customer credit limit
- Calculates up to 3 sales taxes per entry

ACCOUNTS PAYABLE
- Up to 10 vendor payment terms.
- Calculates cash discounts.
- Accepts partial payments
- Automatic posting to General Ledger.
- Prints vendor mailing labels
- Up-to-date vendor information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Prints computer checks or processes hand-written checks.
- Invoices automatically or manually selected for payment



Apple is a registered trademark of Apple Computer, Inc. Macintosh is a trademark of Macintosh Laboratory, Inc. licensed to Apple Computer, Inc. and is used with the express permission of its owner.

Call now to order or for a dealer near you

1-800-247-3224

In Georgia, call 1-404-564-5800

Circle 553 on reader service card

To order by mail send $199 plus $5 shipping to:

Peachtree Software

4355 Shackleford Road, Dept. MAW-11, Norcross, GA 30093

Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Acta version 2.0 supports multiple outlining windows and multiple file formats, including *MacWrite, More, ThinkTank, WriteNow,* text, and Microsoft Rich Text Format. Symmetry Corp., 761 E. University Dr., Mesa, AZ 85203, 602/844-2199. Free upgrade with return of original disk and upgrade form plus $2 s/h; $59.95 new.

Canvas version 1.02 reads TIFF and PICT files without creating any distortion. It creates bezier curves, includes a grabber for hand scrolling, and has a new selection rectangle. Comes with built in F-keys. Automatically repositions ruler shadows and duplicate objects. Text and tool enhancements. Deneba Software, 7855 N.W. 12th St. #202, Miami, FL 33126, 305/594-6965. Free; $195 new.

Copy II Mac version 7.0 recovers accidentally erased files from all Mac hard disks and fully supports the Mac II. Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782. $15 with return of original disks; $39.95 new.

Fontographer version 2.3 adds a circle tool and a faster zooming command; generates more compact PostScript fonts. Non-copy-protected backup copies available. Altsys Corp., 720 Avenue F #108, Plano, TX 75074, 214/424-4888. $30; $395 new.

Laser Author version 1.1 contains new features such as hyphenation with an exception dictionary, page preview, and a faster search and replace. Has the ability to search by style. FLI, P.O. Box 49, Ramsey, NJ 07446, 201/444-5700. Free; $179.95 new.

LogicWorks version 1.3 supports multiple circuit windows. It outputs PICT files and has a strip-chart printing mode and automatic naming features. Shift-click lets you select arbitrary groups of devices and signals for editing. MultiFinder compatible. Works with the new LPLC programmable logic device compiler. Capilano Computing, 525 - 108th NE #6, Bellevue, WA 98004, 604/669-6343. $20; $199.95 new.

Mac3D version 2.1 incorporates new features including color printing and a Help command. Challenger Software, 18350 Kedzie Ave., Homewood, IL 60430, 312/957-3475. $50 upgrade from versions 1.0 and 1.1, $20 upgrade from version 2.0, free upgrade from version 2.0 if purchased after June 15, 1987 (enclose proof of purchase date and return disks); $249 new.

Microsoft Works version 1.1 supports *AppleShare.* It includes VT52 and VT100 emulation. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080. Free if purchased after July 1, 1987, otherwise $25; $295 new.

More version 1.1c uses color in outline and graphic elements; provides color highlighting for individual words or phrases. Color in bullet charts allows for the creation of 35mm slides. New version is bundled with *Acta.* Living Videotext, 117 Easy St., Mountain View, CA 94043, 415/964-6300. $40; $295 new.

Plot-It version 2.06 improves rotated text and arrowhead handling. Mesa Graphics Inc., P.O. Box 600, Los Alamos, NM 87544, 505/672-1998. Free if upgrading from version 2.0; $30 upgrade from version 1.0; $125 new, plus s/h.

Trapeze version 2.0 adds new charts and new layout options, such as headers, footers, and international formats. New functions include block rearrangement, matrix/modeling, selection, and statistics. Lets you import and export files in PICT, WKS, or text. The user interface and calculation capability have been enhanced. This version supports color display on the Mac II and is compatible with all large screens. Data Tailor, Inc., 3113 S. University Dr. #500, Fort Worth, TX 76109, 817/921-6083. Free; $295 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, *501 Second St., San Francisco, CA 94107.*



Tower of power at a "user friendly" price.

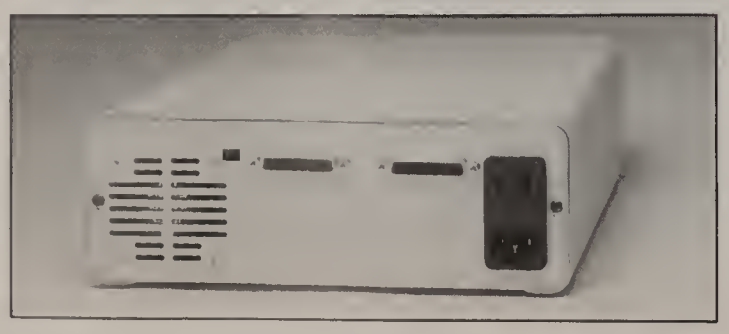
Introducing APPLE CRATE

Our sub systems have been designed to provide quick and easy installation and are fully compatible with Apple Mac Plus, Mac SE and Mac II.

These powerful systems include driver and utility software, an internal power supply, SCSI cabling, all necessary hardware and have been shock mounted for trouble-free transport.

The Apple Crate comes with a 2 YEAR WARRANTY on parts and labor and a direct watts line to our "72 hour turnaround" service department.

Complies with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC rules. Patent pending.



Apple, Apple Mac Plus, Mac SE, and Mac II are registered trademarks of Apple Computer, Inc.

The Apple Crate provides:

- Additional SCSI port which allows daisy-chaining up to 7 SCSI devices
- Convenient fuse holder
- SCSI address select
- Controls and cable controls—clearly marked and easy to operate.

In California **800-323-9994** • Nationwide **800-543-5808**

Call for same day orders or technical support

DISCOVER VISA AMERICAN EXPRESS MasterCard

NATIONAL DATA PRODUCTS Keeping pace with technology. Helping you make the right choices.

300 S. Glendale Ave. #150. Glendale, CA 91205
(213) 382-4149 or (818) 243-5955

Circle 411 on reader service card

Macworld
1987 Annual Index

by Erfert Nielson

This index covers the 12 issues of *Macworld* published during 1987. It lists most products alphabetically as well as under appropriate subject headings. For example, *Packit III* appears under its own name and under Communications, Public domain/shareware, and Utilities. You'll also find it if you look under File compression. Boldface page numbers indicate a reference to a review (r) or a feature-length article.

A B sCenes, ***Feb 158 r***
AAIS Prolog update, *Aug 226*
Aatrix Payroll, *Oct 173*
Abaton C-Scan 300, ***Jul 116 r***
Abaton Drive 5.25, *Aug 108*
Academic Courseware Exchange, *Sep 11*
Accelerator cards, *Apr 150, May 112,* ***Sep 132,*** *Nov 151*
Blue Whale LaserWriter, *Nov 268*
General Computer HyperCharger 020, ***Sep 132 r***
LaserWriter, *Oct 97*
Levco Prodigy SE, ***Sep 132 r***
Mass Micro Systems, *Oct 97*
Network Specialties Jump Board 020, *Sep 176*
Novy, *Jan 13*
Peak Systems Orion, *Jun 180,* ***Sep 132 r***
Prodigy SE, *Jul 174*
Radius, *Jul 174,* ***Sep 132, Nov 151 r***
Ryad, *Jan 13*
SE, ***Sep 132***
Spectra Micro Development, *Jan 13*
Total Systems Integration TSI-020, *Dec 159*
Whizzard, *Jun 180*
Accents, typing, *May 129*
Accountant, Inc., ***May 161 r,*** *Sep 40, 247*
Accounting, *Mar 89, Oct 136. See also* Financial management programs
Aatrix Payroll, *Oct 173*
Accountant, Inc., ***May 161 r,*** *Sep 40, 247*
AMS General Ledger, ***Jan 127 r***
BAKERForms, *Dec 159*
BPI Entry Series General Accounting, ***Feb 149 r***
Business Sense, *Mar 89*
buyer's guide, *Nov 178*
buying tips, *Oct 136*
Flexware, *Oct 136*
Grant Manager, *Nov 267*
Great Plains Accounting Series, *Mar 89,* ***Apr 165 r;*** *Oct 136*
Great Plains Network Manager, *Aug 167*
In-House Accountant, *Sep 175,* ***Nov 162 r*** Insight, *Oct 136*
Multiuser Desktop Accounting, *Oct 173*
multiuser general ledger with Omnis 3 Plus, ***Jan 118***
Personal Manager, *Nov 267*
Rags to Riches, ***Jun 156 r,*** *Oct 136*
Strictly Business Accounts Payable, *Jun 178*
WOS Fund Accounting Software, *Oct 136*
WOS/CTB/McGraw-Hill Fund Accounting, *Aug 174*
Achbar, *Sep 31, Mar 198*
Acius, *Aug 69*
Acronyms defined, *Jan 175*
Acta, *Oct 187, Dec 124*
converting word processing files to, *Sep 36*
update, *Jan 212*
Adams, Douglas, *Aug 93*
Bureaucracy, ***Nov 161 r***
ADB. *See* Apple Desktop Bus
Administrator, *Jul 168*
Adobe Illustrator, *Jan 73,* ***Jun 116 r,*** *Aug 193*
color separations, ***Nov 126***
Adobe Separator, *Nov 126*
Adobe Systems, *Sep 79*
ADON TD-40 tape drive, ***Aug 128 r***
Advanced AI Systems Prolog, *Oct 142*
Advanced technology group, Apple, *Jun 75*
ADS symbol libraries for MGMStation, *Dec 159*
AEC Information Manager, *Nov 267*
AffiniFile, *Dec 159*
AFX, *Dec 71*
AI90 industrial Mac, *Dec 73*
Air Traffic Controller, *Nov 164*
Air Warrior, *Aug 167, Sep 97*
Aircraft design, Mac used in, *Dec 71*
AlisaTalk, *Oct 130*
Amcodyne PhD hard disk, *Jan 102, Dec 108*
Amortization Calculator, *Aug 101*
Amps, *Sep 93*
AMS General Ledger, ***Jan 127 r***
Anatool, ***Jan 118 r,*** *Dec 243*
Andrew system, *Nov 136*
Animation, *Mar 13, 105*
MacMovies, ***Mar 105 r,*** *Nov 11*
Soft Ad, *Nov 11*
VideoWorks, *Mar 13, Nov 103*
VideoWorks II, ***Oct 159 r***
APDA, contacting, *Jun 14*
APL Plus, ***Aug 153 r,*** *Oct 142*
Apple Collection catalog, *Oct 27*
Apple Computer
advanced technology group, *Jun 75*
APDA, contacting, *Jun 14*
Army contract, *Dec 11*
software marketing spinoff, *Jul 13, 43,* ***Aug 17***
Apple Desktop Bus, *Apr 126, 150*
Apple EtherTalk board, *Sep 12*
Apple File Exchange, *Aug 108, Dec 71*
Apple Hard Disk 40-SC, 80-SC, *Dec 108*
Apple HD 20SC, *Jan 102,* ***Mar 140 r,*** *Apr 144, Dec 108*
Apple High-Resolution Monochrome Monitor, ***Jul 108***
Apple Internal 20-SC, 40-SC, 80-SC disks, *Dec 108*
Apple II-Mac file transfer, *Aug 108, Dec 71*
Apple IIGS
Mac programs ported to, *Feb 107*
MactoGS Assembler Linker, *Jan 13*
sharing files with, *Apr 14*

(continues)

Apple menu, backing up info in DAs, *Jan 165*
Apple PC Drive 5.25, *Aug 108*
Apple Tape Backup 40SC, ***Aug 128 r***
AppleColor High-Resolution RGB Monitor, ***Jul 108,*** *Dec 90*
AppleFax modem, *Oct 12*
AppleLink, *Nov 12*
AppleShare, *Mar 53,* ***108 r,*** *Aug 108,* ***Oct 150 r***
effects on software development, *Jun 105*
update, *Sep 11*
AppleTalk, *Sep 199*
enhancing with DuPont fiber optic cable, *Jan 75*
Appointment Diary, *Aug 120*
Aquarium, ***Apr 156***
Arabic Mac, *Jun 109, Aug 99*
word processor, *May 126*
Arazok's Tomb, ***Apr 171 r***
ArchAccount, *Jul 132*
Architects, use of Mac by, *Nov 95,* ***Jul 132***
Area Code Lookup DA, *Aug 120*
Arithmetic, Algebra, MacFunction, *Nov 267*
ArtDisk 1 & 2, *Dec 159*
Artisto, *Jul 93*
ArtScan, *Jul 168*
ASCII, defined, *Jan 175*
Asher JT FaxMac, *Oct 174*
AST, *May 67*
AST-2000, *Dec 108*
AST-4000, *Jan 102,* ***Jul 126 r,*** *Dec 108*
AST Fast-20 hard disk, *Oct 174*
AST Mac86 coprocessor, *Aug 108*
AST SuperScan, *Oct 174*
AST TurboLaser/PS printer, *Nov 270, Dec 77*
AST TurboScan, *Oct 174,* ***Jul 116 r***
AST-ICP, *Jul 168*
AST-Pak, *May 113, Jul 170*
AST-RM4 memory expansion board, *Jul 168*
Astrology, *Mar 93*
Atari ST, Mac file compatibility, *May 13*
Atkinson, Bill, *Oct 126*
Autoblack, *Apr 177, May 105, Oct 187*
AutoCAD vs. Mac programs, *Nov 114*
AutoMac II, *Aug 138, Nov 159 r*
AutoSave DA, *Apr 13, Oct 173*
A/UX, *Apr 131, Oct 95, Nov 136*
Available Key, *Jul 203*
Azimuth MiniCad mapping software, *Feb 95*
Aztec C, ***Apr 167 r,*** *Oct 142*

B

Backup programs
DiskFit Series, *Jun 171*
Copy II Mac update, *Sep 247*
DiskEnsure, *Mar 14*
DiskFit, *Nov 11*
DS Backup, *Sep 175*
Fastback, *Dec 159*
FlashBack, *Feb 169*
HFS Backup for AppleShare, *Jul 167*
tape drive, ***Aug 134***
tips, *Feb 169, Aug 25*
BAKERForms, *Dec 159*
Bar-code reader, *Apr 170*
BASIC compilers, ***May 143 r***
Basic Power System, *Oct 142*
Battery, Mac, *Jul 185*
Battery Pak, *Oct 187*
BBSs. *See* Bulletin boards
Beep Init, ***Apr 156,*** *May 105*
Bering Industries Totem series hard disks, *Dec 108*
Berkeley, Brian, *May 55*
Berklee College of Music, *Jun 109*
Bible on disk, *Dec 159*
Biblio-Link, ***Jan 129 r***
Big Ben DA, *Oct 187*
BigCursor FKey, *Jul 203*
Big Mack Twin Pack hard disks, *Jan 102*
Big Picture, ***Jan 88 r, Jul 108***
Big screens. *See* Monitors
Billiard Parlour, *Nov 164*
Bizcomp IntelliModem 2400, *Oct 174*
Blank, *Apr 177*
Blue Mac, *May 134*
BMX–The Racing Game, *Sep 93*
Boards. *See* Cards
BodyWorks, *Oct 173*
Bouncy, ***Apr 156***
BPI Entry Series General Accounting, ***Feb 149 r***
Brainerd, Paul, *Jan 17*
Bricklin, Dan, *Jan 17*
Bricks DA, *Oct 187*
Bridge update, *Dec 243*
BrushWriter, *May 126*
Buffers, printer, *Mar 174*
Bug, ***Apr 156***
Bulk Mailer, *Sep 140*
Bulletin boards, *Apr 187. See also* Online information services
FidoNet, *Dec 12*
LaserWriter, *Jan 185*
overview, *Sep 229*
Red Ryder Host, *Oct 180*
setting up, *Oct 180*
Bullets & Boxes, *Jun 171, Oct 237*
Bureaucracy, ***Nov 161 r***
Business Class, *Dec 159*
Business Filevision update, *Feb 198*
Business Sense, *Mar 89*
Business Simulator, *Sep 175*
Buyer's Guide, ***Nov 174***

C

C language, *Feb 101*
C-Server, *Jul 141*
C.A.T., *Aug 167,* ***Oct 164 r***
CAD, ***Dec 96.*** *See also* Graphics; MacDraft; MacDraw
architectural applications, ***Jul 132***
AutoCAD vs. Mac programs, *Nov 114, Dec 96*
benchmarks, ***Nov 114***
CAD/CAM Journal, *Dec 96*
CADMover, *Dec 96*
Dimensions, *Jun 105, Dec 96*
DrawStructures, *Nov 267*
DXF Transfer, *Oct 173*
EZ-Draft, ***Nov 114, Dec 96***
Frame Mac, ***Oct 158 r,*** *Dec 96*
IGES translators, *Apr 13,* ***Dec 96***
Mac Designer, *Dec 96*
MacFlow, ***Mar 149 r***
MacPerspective, *Jul 132*
MGMStation, *Jul 31, 132, Nov 43,* ***114, Dec 96, 159***
MiniCad, *Feb 95,* ***Jun 158 r,*** *Jul 132,* ***Nov 114, Dec 96***
MSC/pal, *Apr 13, Dec 96*
ncCAD/ncCAM, *Dec 96*
NewStudio, *Jul 132*
PowerDraw, *Nov 43*
Schema, *Jul 132*
Sizer and Adjacency DA, ***Mar 150 r***
Snap, *Dec 96*
Space Edit, ***Jul 160 r***
3-D digitizer, *Feb 95*
VAXDraw, *Dec 96*
VersaCAD, *Sep 12, Oct 99, Nov 116, Dec 96*
Calculator+ DA, *Aug 120*
CalendarMaker, ***Mar 152 r,*** *Sep 247*
Calliope, ***Feb 160 r,*** *May 216, Dec 246*
Camera, *Jun 187, Oct 187*
Canfield, *Sep 93*
Canion, Rod, *Jan 17*
Canvas, *Aug 11, Oct 173*
Cap'n Magneto, *Nov 164*
CAPPS, *Dec 159*
Cards. *See also* Accelerator cards; Coprocessors; IBM PC file transfer; Upgrades; Video cards
Apple EtherTalk board, *Sep 12*
Apple graphics, *Apr 133*
AST, *May 67*
AST Mac86, *May 13, Jul 170, Aug 108*
AST Mac286, *May 13, Jul 172, Aug 108*
color, *Apr 133, 150*
communications, *Apr 150*
Ethernet, *Aug 11, 108*
installation procedure, *Sep 65*
Jasmine Monochrome Video Board, *Aug 177*
Levco Prodigy SE, ***Sep 132 r***
Mac II video, *Dec 90*
MacMemory multifunction board, *Jan 13*
MS-DOS coprocessors, *Apr 150, Aug 108*
National Semiconductor memory upgrade, *May 13*
National Semiconductor video buffer, *May 13*

NB-MIO-16, *Jul 172*
NuBus, *Apr 126, 129*
parallel processing, *Jun 103*
Peak Systems Orion, *Jun 180,* ***Sep 132 r***
PerfecTek MacPlusPC, *Aug 108*
Radius accelerator, ***Sep 132***
Radius expansion card, *Aug 53*
SuperMac color video, *Apr 150*
Carriage returns, inserting or stripping, *Nov 99*
Carrying cases
ImageWriter Bag, *Jun 180*
Mac Plus Bag, *Jun 180*
Macinware SE, *Aug 179*
Print Plus Case, *Jun 180*
Sofbags System, *Jun 182*
The Bag, *Jun 182*
Chalcedony Prolog, *Oct 142*
Change Font DA, *Aug 120*
CheapPaint DA, ***Jan 96 r,*** *Aug 120, Oct 187*
Check mark, typing, *Dec 212*
Check-In BBS, *Sep 229*
ChemIntosh, *Oct 173*
Chessmaster 2000, *May 99, Dec 118*
Children's programs. *See* Education; Games
China, Mac in, *Mar 99, Sep 12, 31*
Chinese word processor, *Jan 83, May 126*
CineWrite, *Apr 13, Aug 167*
Click & Clip, *Nov 267*
ClickOn Worksheet, purchase by Borland, *Feb 14*
Clicktracks, ***Sep 158 r***
Client/Mac, *Sep 140*
Client Portrait, *Nov 267*
Clients & Profits, *Sep 175*
Clip art, *Aug 193*
ArtDisk 1 & 2, *Dec 159*
Click & Clip, *Nov 267*
Coloring Book & Clip Art Software, *Aug 167*
Comicards, *Oct 173*
Drawings by Leonardo, *Oct 173*
MacMemories, ***Mar 147 r***
Mac the Knife 4 and 5, *Dec 159*
PICTures, *Nov 268*
Sea Life, *Oct 173*
stored on CD ROM, *Jun 14*
Thinking Tools, *Nov 268*
Clipboard, formatted text in, *Jul 177*
Clipper, *Mar 91,* ***Jul 148 r,*** *Oct 187*
Clock, ***Apr 156***
Cloverleaf character, typing, *Dec 212*
CMC HardMac series hard disks, *Jan 102*
CMS Enhancements hard disks
Compact 20a, 40, *Dec 108*
High Capacity Series, *Dec 108*
MacStack 20, 40, 43, 80, *Dec 108*
Pro80-II/i and Pro 43-II/i hard disks, *Oct 176*
Pro Series, *Dec 108*
S240, ***Jul 126 r***
CoCoPro, *Dec 159*
Codex 2260 modem, ***Jul 138 r***
Color
added to 3-D graphics programs, *Jul 14*
Mac II, *Apr 132, 154,* ***Dec 90***
monitors, ***Jul 108,*** *Dec 90*
printing on ImageWriter II, *Feb 97*
separations, *Mar 95,* ***Nov 126,*** *Dec 11*
video cards, *Apr 133, 150,* ***Jul 108***
Color Cutter, *Dec 11*
Comic Strip Factory, *Sep 247, Nov 43*
Comicards, *Oct 173*
Command Center Plus, *Sep 182*
Command Typographer, *Nov 267*
Command, *Dec 69*
Comment, ***Oct 167 r***
Communications. *See also* IBM PC file transfer; Modems; Networks; on-line information services; Terminal emulators
AFX, *Dec 71*
AppleShare, *Mar 53,* ***108 r,*** *Jun 105, Aug 108, Sep 11,* ***Oct 150 r***
Asher JT FaxMac, *Oct 174*
AST-ICP, *Jul 168*
BackDown DA, *Oct 91*
BBS setup, *Oct 180*
Blue Mac, *May 134*
buyer's guide, ***Nov 214***
cards, *Apr 150*
choosing software, *May 181*
CompuServe's menus, navigating, *Jul 177*
Desktop Express, ***Oct 154 r,*** *Nov 12*
download in background, *Oct 91*
EicoNet, *Feb 13*
E-mail, *Feb 140, May 97, 154, Sep 152, 199, Nov 12, Dec 12, 67*
fax documents, *Oct 12, Dec 11*
FCC access fee for online services, ***Sep 17***
FModem, ***Apr 173 r***
Griffin Terminal terminal emulation, *May 134*
InBox, ***Feb 140,*** *Aug 108*
inTalk, ***Aug 160 r***
InterMail, *Aug 108*
inTouch terminal emulation, *May 134*
introduction to, ***Apr 187***
LBI Repeater Box, *Nov 268*
Linkware Mac Connection, *Sep 175*
Mac as telex, *Oct 180*
Mac SE, *May 113*
Mac240 terminal emulation, *May 134*
Mac2624 terminal emulation, *Jan 38*
MacFax, *Dec 11*
MacGeorge, ***Jul 153 r***
MacKermit terminal emulation, *May 134*
MacLine terminal emulation, *May 134*
MacMail Telecom terminal emulation, *May 134*
MacMainframe, *May 134*
MacMainFrame SE, *Jul 170*
MacTerminal, *May 134, Dec 243*
mainframe, *May 134, Jul 170,* ***Oct 130***
MicroPhone, *May 134, Aug 185, Sep 248*
MockTerminal, ***Apr 173 r,*** *Oct 187*
MultiTalk MT-100 Port Server, ***Dec 145 r***
Navigator, *Dec 67*
Netway 1000, *May 134*
NetWay N1000A communications server, ***Nov 150 r***
OfficeTalk, *Jul 167*
Pac Bell multiplexer, *Apr 113*
Pacer pcLink terminal emulation, *May 134*
Packit III, *Sep 245*
PC InBox, *Aug 108*
pcLink, *Oct 130,* ***Nov 161 r***
PhoneNet, *Mar 13, Oct 130,* ***Dec 136 r***
Project Victoria, *Apr 113*
QDial DA, *Sep 245*
Red Ryder, *Feb 14,* ***Apr 199,*** *May 13, 134, Jun 354, Jul 31*
Red Ryder Host, *Oct 180*
Return at end of each line, *Aug 185*
S/3XLink, *May 134*
shareware programs, ***Apr 173***
Smartcom II, *May 134*
Tekalike, *May 134*
Telescape Pro terminal emulation, *May 134*
TermWorks, ***Apr 173 r***
text wrap problems with mainframes, *Aug 185*
TOPS Terminal, *Dec 159*
VersaTerm, *May 134*
VersaTerm-Pro, *May 134*
Visions Plus, *May 134*
X*Press Information Services, *Feb 99*
Compatibility, Mac II software, *Nov 108*
Composite Wing Optimization, *Jun 171, Dec 71*
Compugraphic CG 400-PS printer, *Aug 11*
CompuServe, *Apr 187*
navigating menus, *Jul 177*
CompuSketch, *Dec 73*
Computer Baseball, *Jul 57*
Computer Ware, *Mar 91*
Computer-aided design. *See* CAD
Computerized Gardening, *Mar 91*
ComServe, *Jun 171, Jul 141*
ConcertWare+, support for Sonata font, *Feb 14*
Consulair 68000 assembler, *Oct 142*
Consulair Mac C, *Feb 198,* ***Jul 155 r***
Control Panel, Mac II and SE, *Apr 144*
Convert DA, *Aug 101*
Copier, *Feb 169*
Coprocessors, *Apr 150, May 113, Sep 132*
Hypercharger 020, *Jul 170*
MS-DOS, *Apr 150, Aug 108*
Copy II Mac, *Feb 169*
update, *May 216, Sep 247*
Copy Screen, *Jul 203*
Coral Lisp, *Jan 13*
Cornerstone Vista 1600 monitor, *Oct 176*
Corporate Image Templates, *Jul 167*

(continues)

Corporate Software, distribution of Mac programs, *Jul 13*
Course Builder, *Aug 167,* ***Dec 149 r***
Courseware. *See* Education
Covers, Mac, *Jun 182*
CPU upgrades. *See* Upgrades
Crabs, ***Apr 156***
CrashFix, *Apr 183*
Cray computer, Mac as workstation for, *Apr 115*
Cray, Seymour, *Jul 103*
Cricket Draw, ***May 148 r;*** *Aug 193*
color separation, ***Nov 126***
form design with, *Sep 124*
tips, ***Aug 217***
Cricket Graph
overlay plot tip, *Nov 278*
update, *Feb 198*
Cricket Presents, *Oct 43*
CryptoSolve, *Sep 93*
Crystal Paint, *Sep 175*
CrystalRaidr, *Sep 93*
Cue, *Jun 111, Jul 167, Aug 138,* ***Sep 158 r***
Curly quotes, *Sep 163*
Cutting Edge 30 hard disk, *Dec 108*
Cybernetic Composer, *Aug 97*

D

DA Installer+, *Jun 187*
DA Key, *Jul 203, Nov 99*
Da Mob. *See* Suitcase
DAs. *See* Desk accessories
DA Switcher, *Nov 267*
Dark Castle, ***Mar 146 r;*** *Dec 118*
Data acquisition, *Apr 150, Sep 178, Nov 268*
Databases
AEC Information Manager, *Nov 267*
C.A.T., *Aug 167,* ***Oct 164 r***
DEC Helix, *Dec 12*
dMac III, ***Feb 152 r***
FileMaker Plus, ***Jan 131 r;*** *Dec 210*
4th Dimension, ***Jul 122 r;*** *Aug 69*
Helix VMX, *Jan 13*
introduction to, *Jun 197*
Omnis 3 Plus multiuser general ledger, ***Jan 118***
OverVue tips, ***May 191***
Data Desk, ***Aug 157 r***
Datadesk keyboard, *Aug 53*
Data Exchange, *Apr 14, Jun 178*
Data Port, ***Feb 154 r***
Dataproducts LZR-2665, ***Jun 122 r***
Data Tower, *Jun 178*
Date Key, *Jul 203*
dates before 1904, *Apr 34, Jul 36*
Dayna FT-100 drive, *Aug 108*
DaynaFile disk drive, *Aug 108, Sep 11, Nov 268*
dbMan-Mac, *Jun 171*
DC Systems Easy Drive series, *Jan 102*
Debugger, *Mar 13*
DEC Helix, *Dec 12*
DEC ScriptPrinter, *Dec 77*
DEC terminal emulators, *May 136*
Decimal points, lining up in Excel, *Jul 179*
Deep Angst, *Nov 164*
Dell, Michael, *Jan 17*
Deluxe Music Construction Set, ***Mar 142 r***
Design, ***Feb 148 r***
update, *May 216, Dec 243*
Desk accessories, *Aug 120,* ***Oct 187***
Acta, *Oct 187, Dec 124*
Amortization Calculator, *Aug 101*
Appointment Diary, *Aug 120*
Area Code Lookup, *Aug 120*
Art Grabber+, *Oct 187*
Artisto, *Jul 93*
Autoblack, *Apr 177*
AutoSave, *Apr 13, Oct 173*
backing up info in, *Jan 165*
Battery Pak, *Oct 187*
Big Ben clock, *Oct 187*
Blank, *Apr 177*
Bricks, *Oct 187*
Calculator+, *Aug 120*
Camera, *Jun 187, Oct 187*
Change Appl Font, *Nov 99*
Change Font, *Aug 120*
CheapPaint, ***Jan 96 r;*** *Aug 120, Oct 187*
ChemIntosh, *Oct 173*
Comment, ***Oct 167 r***
Convert, *Aug 101*
CrashFix, *Apr 183*
DA Installer+, *Jun 187, Oct 187*
DA Key, *Jul 203, Nov 99*
DA Switcher, *Nov 267*
Desk Necessities, ***Jun 167 r***
DeskZap, *Jan 195, Aug 101*
DiskInfo, *Oct 187*
DiskTools, ***Dec 144 r***
DiskTools Plus, *Nov 93*
DiskTop, *Jul 167, Aug 120,* ***146 r***
Display Message, *Aug 120*
Double Apple, *Jul 177, Aug 120, Oct 187*
Envelope, *May 14*
Fade to Black, *Apr 177*
FileStar, *Jul 167, Aug 101*
Find File, *Jan 13*
FKey Runner, *Nov 99, Jan 195*
Font/DA Mover, *Feb 112,* ***Aug 124,*** *Dec 27*
Graham Speller, *Dec 159*
Grep-Wc, ***Sep 163 r***
Hard Disk Partition, ***Aug 158 r***
HelpDA, *Aug 101*
HelpFileMaker, *Aug 101*
HFS Find, *Aug 101*
HFS Locator, *Oct 187*
installing more than 15, *Feb 164, Jun 187, Jul 177, Aug 11, 126, Sep 99, Oct 187, Dec 150*
introduction to, ***Oct 187***
Knockout, *Aug 120, Oct 187*
LaserStatus, *Aug 120*
LaserWriter Reset, *Jul 93*
LockOut, *Jul 93*
LookUp, ***Dec 146 r***
Mac-Hy-phen, ***Jan 135 r;*** *Jun 35*
MacEqn, ***Jan 133 r***
MacInHebrew, *May 171*
MacLightning, *Aug 120, Sep 248, Oct 114, 187*
MathType, *Aug 170*
MenuFonts, *Aug 170, Sep 11*
Mickey Mouse clock, *Oct 187*
miniWriter, *May 176,* ***Sep 163 r;*** *Oct 187*
MockChart, *Aug 120*
MockPackage, *Oct 187*
MockTerminal, ***Apr 173 r***
MockWrite, *Oct 187*
Multiuser Appointment Diary, *Oct 173*
New Scrapbook, *Jul 93*
Other, *Jan 195, Jul 177, Oct 187*
Outlook, *Dec 124*
overview, ***Aug 120***
Periodic Table, *Aug 101*
QuickDex, *Aug 170*
Run'r, *Jan 195*
SafeLaunch, *Oct 187*
Saviour, *Jul 93, Aug 120*
screen savers, *Apr 177, May 105*
ScreenLocker, *Aug 120*
Set Paths, *Jul 93*
SideKick, *Aug 120, Oct 187*
SimpleSpan, *Jun 178*
Sizer and Adjacency, ***Mar 150 r***
SkipFinder, *Jan 195*
Smart Alarms, *Aug 120, Oct 187*
Smart Quotes, ***Sep 163 r***
SmartScrap, *Mar 91, Aug 120, Oct 187*
StuffClip, *May 176*
Suitcase, *Aug 11, Sep 99,* ***Dec 150 r***
SuperHelp, *Aug 101*
Tempo, *Jun 14, Oct 187*
Thunder, *Oct 187*
Time Logger, *Nov 99,* ***165 r***
Timeout, *Nov 164*
ToggleKeys, *Nov 99*
Voila, *Oct 187, Dec 124*
Windows, *Jul 93*
Word Finder, *Nov 268*
DC Systems Easy Drive series, *Jan 102*
Desk Necessities, ***Jun 167 r***
DeskScene, ***Apr 156***
Desktop Express, *May 97, Sep 152,* ***Oct 154 r;*** *Nov 12*
Desktop file, rebuilding, *Apr 180*
Desktop pattern, changing, *Nov 273*
Desktop presentations, *Apr 115, Jun 152*
Desktop publishing. *See* also Adobe Illustrator; Cricket Draw; MacPublisher; PageMaker; Quark XPress; Ragtime; ReadySetGo
books on, *Feb 97*
color separations, *Mar 95,* ***Nov 126***
evolution of, *Jan 47, 75*

GraphicWorks, *Sep 124*
ImageStudio, ***Dec 138 r***
Interleaf, *Oct 93*
Just Text, *Sep 124*
Lithographer, *Nov 97*
MacDraw tips, ***May 203***
MacTeX, *Sep 124*
multiuser page layout, *Aug 11*
newspapers, *Feb 131, Jun 111, Sep 91, Dec 11, 73*
overview, ***Jan 112, Sep 124***
PageOne, *Mar 93*
PostScript text effects, *Mar 95*
print shop primer, ***Aug 114***
Scoop, *Aug 174, Sep 124*
Solo, ***Jan 112,*** *Feb 13*
standards, *Jan 14, Sep 103*
TechScriber, *Feb 103*
templates, *Apr 14*
Textures, *Sep 124*
turnkey systems, *Jan 74*
at Univ. of Missouri Journalism School, *Jul 95*

Desktop tips, ***Apr 205***
Desktop Video System, ***Feb 153 r***
Desktoppers BBS, *Sep 229*
DeskZap, *Jan 195, Aug 101*
Dhuey, Mike, *May 55*
Dictionaries, foreign-language, *Feb 97*
Digital Darkroom, *Dec 11*
Digitizers, *Feb 14,* ***Mar 133, Jul 116, Nov 244***
Abaton C-Scan 300, ***Jul 116 r***
ArtScan, *Jul 168*
AST SuperScan, *Oct 174*
AST TurboScan, ***Jul 116 r;*** *Oct 174*
buyer's guide, ***Nov 244***
gray-scale scanners, *Dec 69*
Image Scanner, *Jun 180*
ImageStudio, ***Dec 138 r***
Imagizer, *May 103*
Jetreader, *Mar 135*
lighting tip, *Jul 34*
LSP300, *Mar 135*
MacScan, *Feb 107,* ***Jul 116 r***
MacVision, ***Mar 133 r***
Microtek MS-300A, ***Jul 116 r***
Microtek MS-300C, *Sep 178*
Model 730, *Mar 135*
MSP3000, *Mar 135*
Neotech Image Grabber, *Nov 270*
OCR add-on, *Nov 268*
PC Scan Plus, ***Jul 116 r***
ThunderScan, ***Mar 133 r;*** *May 14,* ***Jul 116 r;*** *Sep 248*
TrueForm System, *Sep 182*

Digitizing tablets, ***Mar 143 r***
Dimensions, *Jun 105, Dec 96*
Dingbat variations, *Oct 182*
Disk carriers, ***Apr 168 r***
Disk Copy, *Feb 169*
Disk directory full, avoiding, *May 173*

Disk drives. *See* also Hard disks
Apple PC Drive 5.25, *Aug 108*
cleaning, *Jul 185*
CMS Enhancements Pro-40 internal, *Jul 14*
Dayna FT-100, *Aug 108*
DaynaFile, *Aug 108, Sep 11*
IBM PC-compatible, *Aug 108*
internal floppy, *Jul 14, Sep 176*
Jasmine MegaDrive, *Sep 93*
Mirror internal 800K drives, *Nov 270*
1.6MB, *Jun 14*
placement of external floppy drive, *Aug 25*

Disk duplicator, *Oct 176*
Disk First Aid, *Jan 13*
Disk holders, overview, ***Oct 169 r***
Disk Librarian, *May 27*
Disk sleeves, *Dec 209*
Disk space available tip, *May 174*
Disk-File Utility, *Jul 203*
Disk/file management
DeskZap, *Jan 195, Aug 101*
Disk-File Utility, *Jul 203*
DiskTools, ***Dec 144 r***
DiskTools Plus, *Nov 93*
DiskTop, *Jul 167, Aug 120,* ***146 r,*** *Sep 247, Dec 243*
FileStar, *Jul 167, Aug 101*
Findswell, ***Dec 146 r***
folder navigation tip, *Oct 182*
Hard Disk Partition, *Jul 126,* ***Aug 158 r***
HFS Find, *Aug 101*
HFS Locator Plus, *Oct 237*
Pathname FKey, *Jul 203*
SetFile Key, *Jul 203*

DiskEnsure, *Mar 14*
Disk Express, ***Feb 156 r***
DiskFit, *Jun 171, Nov 11*
DiskInfo, *Oct 187*
DiskQuick, *May 27, Dec 243*
Disks, formatting 800K MFS, *Jan 172*
DiskTimer II, *Jul 126*
DiskTools, ***Dec 144 r***
DiskTools Plus, *Nov 93*
DiskTop, *Jul 167, Aug 120,* ***146 r,*** *Sep 247, Dec 243*
Display Message DA, *Aug 120*
Display PostScript, *Dec 11*
Displays. *See* Monitors
dMac III, ***Feb 152 r***
DNA Inspector II, *Sep 247, Oct 27*
Dollars and Sense, *Feb 189*
Double Apple, *Jul 177, Aug 120*
Double Feature, *Sep 175*
Double Helix update, *Mar 198*
Doug Clapp's Word Tools, ***Sep 162 r;*** *Dec 30*
Douglas CAD/CAM, *Aug 167*
Dow Jones Market Manager Plus, *Apr 111*
Dr. B. Careful, *Nov 267*
Drawings by Leonardo, *Oct 173*
DrawStructures, *Nov 267*
DS Backup, *Sep 175*
DSP 1000 digital audio recorder, *Jun 13*
Duck Hunt, *Sep 93*
Dungeon of Doom, *Nov 164, Dec 118*
Dvorak keyboard, *Jul 34, 203*
DXF Transfer, *Oct 173*
Dyaxis, *Jun 178*
Dynamac, *Feb 13,* ***120,*** *Jun 38, Sep 11*
Dyson, Esther, *Feb 61*

E

EarthPlot, ***May 166 r***
EarthWorks, *Oct 173*
Easy as ABC, ***Feb 158 r***
Easy Drive series, *Jan 102*
Easy3D, use in animation, *Mar 104*
Education. *See* also University Consortium
A B sCenes, ***Feb 158 r***
Academic Courseware Exchange, *Sep 11*
Apple research grants, *Feb 99*
BodyWorks, *Oct 173*
coaching writers by modem, *Dec 67*
computer's role in, *Feb 21*
Course Builder, *Aug 167,* ***Dec 149 r***
creating educational games, ***Mar 123***
Dr. B. Careful, *Nov 267*
EarthWorks, *Oct 173*
Easy as ABC, ***Feb 158 r***
Educom '86 Conference, *Feb 21*
English Consortium, *Aug 95*
First Shapes, ***Nov 160 r***
Geometry, ***Feb 157 r***
HyperCard courseware, *Dec 77*
Kieran, *Aug 167*
Listen, ***Dec 148 r***
MacRobots, ***Nov 160 r***
MacTAG grading aid, *Jun 172*
Math Blaster, ***Apr 172 r***
Object Logo, ***Jun 162 r***
Physics, *Oct 173*
Practica Musica, *Aug 170*
Prose, *Aug 95*
Smart Words, *Jun 178,* ***Dec 141 r***
Terrapin Logo, *Aug 174*
test creation, ***Jan 134***
Tools for Writers, *Aug 95*
Typing Intrigue, ***Mar 148 r***
Typing Made Easy, ***Mar 148 r***

Educom '86 Conference, *Feb 21*
Ehman Engineering HDD-20 hard disk, *Jan 102*
Ehman Engineering HD-20, HD-40 hard disks, *Dec 108*
8110-A Gateway, *Aug 174*
EicoNet, *Feb 13*
EMAC hard disks, *Dec 159*
EMACMD2400 modem, *Dec 159*

(continues)

E-mail
AppleLink, *Nov 12*
Desktop Express, *May 97, Sep 152, Oct 154, Nov 12*
FidoNet, *Dec 12*
InterMail, ***May 154 r***
introduction to, *Sep 199*
OfficeTalk, ***Sep 152 r***
EmDash Fonts, *Nov 267*
Encryption/security, *Jun 166, Nov 11, Dec 243*
Engineering. *See* also CAD
aircraft design, *Dec 71*
buyer's guide, ***Nov 190***
Composite Wing Optimization, *Jun 171*
Fitting Analysis, *Jun 171*
Frame Mac, ***Oct 158 r,*** *Dec 96*
HEC-2, *Jun 171*
MacCOGO, *Dec 12*
SimpleSpan, *Jun 178*
English Consortium, *Aug 95*
Entertainment. *See* Games; Music
Envelope, *May 14*
Envelopes, printing, *Mar 159*
Equations, typing on Mac, *Jan 133, Apr 117*
ERVision, *Dec 159*
EtherServe, *Mar 114*
EtherTalk, *Sep 12, Oct 93*
Eureka: The Solver, *May 14, Aug 167*
European Macworld Expo, *Sep 101*
Everex EMAC series hard disks, *Dec 108*
Excel. *See* Microsoft Excel
Excellent Exchange Collection, *Jun 171, Aug 151 r*
mail-merge template, *Sep 140*
Excellerate, ***Dec 142 r***
Executive Office, *Sep 140*
ExpanSE, *Dec 159*
ExperCommonLISP, *Jan 13*
ExperLisp, *Oct 142*
ExperLogo, *Oct 142*
Expressionist, *Jun 171*
EyeSaver monitor, *Dec 159*
EZ-Draft, ***Nov 114,*** *Dec 96*
EZTax-Plan, *Feb 189, Mar 198*
EZTax-Prep, *Feb 189*

F

Fade to Black, *Apr 177*
Falcon, *Jun 103*
Family Roots update, *Nov 321*
Fanny Mac, *Jul 185, Sep 190*
Fans, *May 172, Jul 185,* ***Nov 311 r***
installing, *Mar 35*
screen jitter caused by, *Sep 190*
Fastback, *Dec 159*
Fastcomm 2496 modem, ***Jul 138 r***
FastPath3, *Jun 180*
FastPort, ***Feb 154 r***
Federal government, use of Macs by, *Jul 99*
Fast Forms Construction Kit, *Nov 267*
Fedit
enlarging system heap with, *Feb 163*
recovering files with, *Apr 61, 215*
FeiMa Chinese word processor, *Jan 83, May 126*
Ferrari Grand Prix, *Feb 101,* ***May 163 r,*** *Dec 118*
FidoNet, *Dec 12*
File compression, *Sep 245*
File management. *See* Disk/file management
File recovery
Fedit, *Apr 61, 215*
1st Aid Kit, *Apr 220*
File servers, *Sep 199*
FileMaker Plus, ***Jan 131 r,*** *Dec 210*
mail merge, *Sep 140*
FileStar, *Jul 167, Aug 101*
Film. *See* Movies
Film recorders, *May 13*
ImageMaker, *May 13, Jun 107, Sep 182*
Filter, screen, *Jul 185*
Financial Decisions, *Aug 167*
Financial management programs, *Feb 189, Jan 203. See* also Stock market analysis; Tax preparation
buyer's guide, ***Nov 178***
Dollars and Sense, *Feb 189*
In-House Accountant, ***Nov 162 r***
MacMoney, ***Nov 152 r***
Masterpiece, ***Oct 157 r***
Optum-3, ***Oct 166 r***
Find File, *Jan 13*
Finder. *See* also Finder alternatives
customizing, *Oct 97*
determining version number of, *Jan 165*
MultiFinder, ***Oct 108 r***
placing files with long names in Trash, *Sep 194*
tips, ***Apr 205***
Finder alternatives, ***Jan 195,*** *May 27, 28*
DiskTools, ***Dec 144 r***
DiskTools Plus, *Nov 93*
DiskTop, *Aug 20,* ***146 r,*** *Sep 247, Dec 243*
Oasis, *Jul 31*
PowerStation, *Sep 99,* ***Dec 150 r***
SafeLaunch, *Jul 203*
Waystation, *Jan 35, 195*
Findswell, *Jun 171,* ***Dec 146 r***
1st Aid Kit, *Apr 220,* ***Jul 153 r***
First CAD, *Feb 14,* ***Jul 203***
First Shapes, ***Nov 160 r***
Fitting Analysis, *Jun 171*
F-keys, *Jan 195,* ***Jul 203,*** *Oct 187*
ClipperKey, *Nov 99*
FKey Installer, *Jan 195*
FKey Maker, *Jul 203*
FKey Manager, *May 105,* ***Jul 203***
FKey Runner, *Jan 195, Nov 99*
Flush FKey, *Jul 203*
Fontsie, *Jul 203, Nov 99*
Launch DA/FKey, *Nov 99*
FlashBack, *Feb 169*
FlashFinder, *Jan 195*
Flat-screen Mac, *Feb 13,* ***120,*** *Jun 38, Sep 11*
Flexware, *Oct 136*
Flip 40 Meg internal drive, *Sep 176*
FloppiClene Upgrade Kit, *Sep 182*
FlowMaster, *Nov 267*
Fluent Fonts update, *Nov 321*
Fluent Laser Fonts update, *Jan 212*
Flush FKey, *Jul 203*
FModem, ***Apr 173 r***
Focal Point, *Dec 159*
Focus, *Sep 31*
Folder size in HFS, *Oct 179*
Font/DA Mover, *Feb 112,* ***Aug 124,*** *Dec 27*
installing DAs in applications, *Feb 164*
Fontographer, *Apr 42*
Fonts, ***Feb 112,*** *Sep 108*
Adobe, *Aug 11*
Adobe downloading software, *Jun 13*
bit-mapped that look good on LaserWriter, *Jan 185*
Bullets & Boxes, *Jun 171, Oct 237*
CasadyWare, *Feb 99*
Change Appl Font DA, *Nov 99*
Change Font DA, *Aug 120*
downloading, ***Feb 112***
editing, *Oct 99*
Egyptian heiroglyphics, *Jun 99*
ElectroFonts, *Dec 159*
EmDash Fonts, *Nov 267*
equation, ***Jan 133 r***
Fluent Fonts update, *Nov 321*
font cache, *Sep 108*
Fontographer, *Apr 42*
Fontsie FKey, *Jul 203, Nov 99*
foreign-language, ***May 126,*** *Oct 36*
GreyFonts, *Feb 14*
introduction to, ***Feb 112***
kanji, *May 13*
kerning with ResEdit, *Jan 185*
LaserPerfect, *Jun 40*
LaserWriter, *Jan 185*
LaserWriter fractions, *Oct 87*
LaserWriter shareware, *Oct 87*
LogiFont, *Dec 159*
mathematics, *Apr 117, Jul 167*
MathFract, *Jul 167*
MenuFonts DA, *Aug 170, Sep 11*
new characters on SE keyboard, *Dec 212*
pictorial, *Apr 117*
PIXymbols One, *Nov 268*
printing large sizes in MacDraw, *Oct 179*
public domain, *Apr 117*
SciFonts, *Dec 159*
screen font sizes tip, *Oct 30*
screen vs. printed boldface text, *Apr 177*
SMUG Fonts Part 1, *Jun 178*
TextEffects, *Mar 95*
Fontsie FKey, *Jul 203, Nov 99*
Fool's Errand, *Oct 173, Dec 118*
Footnote tip, *Feb 167*

For Sale, *Oct 174*
Forecast, *Feb 189, Aug 226*
Forecasting and Time-Series, *Jan 203*
Forethought, acquired by Microsoft, *Oct 11*
Formation, *Jan 74*
FormDesign, *Jun 171*
Forms design
Fast Forms Construction Kit, *Nov 267*
FileMaker Plus, ***Jan 131 r***
Formation, *Jan 74*
FormDesign, *Jun 171*
TrueForm, *Nov 270*
FORTRAN77, *Oct 142*
4th Dimension, *May 14, Jun 99,* ***Jul 122 r,*** *Aug 69*
Fractals
Fractal Contours, *Mar 91*
MacFractal, *Aug 28*
Super MandelZoom, *Aug 28*
Frame Mac, ***Oct 158 r,*** *Dec 96*
Franklin Telecom MacTwenty hard disk, *Oct 174*
FT100 file transfer utility, *Mar 13*
Full Page Display. *See* Radius Full Page Display
FullPaint, ***Jan 96 r***
printing miniatures in, *Oct 182*
saving screen dumps as FullPaint files, *Mar 169*
update, *Jan 212*
FullWrite Professional, *Feb 13, Sep 95*
FWB Software hammer series hard disks, *Dec 108*

G

Games, *Dec 118*
Air Traffic Controller, *Nov 164*
Air Warrior, *Aug 167*
Amps, *Sep 93*
Arazok's Tomb, ***Apr 171 r***
Billiard Parlour, *Nov 164*
BMX–The Racing Game, *Sep 93*
Bricks DA, *Oct 187*
Bureaucracy, ***Nov 161 r***
Business Simulator, *Sep 175*
Canfield, *Sep 93*
Cap'n Magneto, *Nov 164*
Chessmaster 2000, *May 99, Dec 118*
clue books, *Jan 168*
commentary, *Jul 57*
creating on Mac, ***Mar 123***
CryptoSolve, *Sep 93*
CrystalRaidr, *Sep 93*
Dark Castle, ***Mar 146 r,*** *Dec 118*
Deep Angst, *Nov 164*
Duck Hunt, *Sep 93*
Dungeon of Doom, *Nov 164, Dec 118*
educational, *Feb 158*
Falcon, *Jun 103*
Ferrari Grand Prix, *Feb 101,* ***May 163 r,*** *Dec 118*
Fool's Errand, *Oct 173, Dec 118*
Go, *Sep 175, Dec 118*
Golf, *Sep 93*
Gunshy, *Sep 93*
Hall of Fame Annex, *Dec 118*
Hardball, *Jul 57, Dec 118*
Hearts, *Sep 93*
Iggy Iggopolis, *Sep 93*
King of Chicago, *Apr 121,* ***Jul 152 r***
Klondike, *Sep 93*
Knockout, *Aug 120, Oct 187*
Leather Goddesses of Phobos, ***Aug 159 r***
Leisure Suit Larry in the Land of the Lounge Lizards, ***Dec 142 r***
Lurking Horror, *Sep 175*
Mac Man, ***Jun 159 r,*** *Oct 237*
Mac Pro Football, *Jan 81,* ***Jul 157 r,*** *Nov 38*
MacRacquetball, *Oct 173,* ***Nov 154 r***
Maze Survival, *Nov 267*
Maze Wars, ***Oct 151 r***
Memory, *Sep 93*
MicroLeague Baseball, *Jul 57*
multiuser, *Jan 129, Aug 167, Sep 97, Oct 151*
NetTrek, *Sep 97*
Neuromancer, *Apr 21*
NFL Challenge, ***Jul 157 r,*** *Nov 36, 38*
Nord and Bert, *Dec 159*
OrbQuest, ***Feb 150 r***
Patton vs Rommel, *Feb 101,* ***Aug 151 r***
Phrase Craze Plus, *Sep 93*
Portal, ***Sep 160 r***
Professor Craps, *Nov 268*
Rainy Day Games, *Sep 176*
Roadwar 2000, *Jun 178*
Scarab of Ra, *Nov 164*
Scrabble, *Apr 14, Dec 159*
ShadowGate, ***Sep 168 r***
Shanghai, ***Jan 136 r***
Smash Hit Racquetball, *Jan 81*
Space Quest, ***Oct 165 r***
Stationfall, *Sep 176*
Strategic Conquest II, ***Jan 129 r***
Sub Battle Simulator, ***Jul 161 r***
Tass Times in Tonetown, ***Jun 165 r,*** *Dec 118*
text adventures, *Apr 109*
Timeout, *Nov 164*
Transylvania hints, *Jan 168*
Whodunit, *Jul 168*
World Builder, *Nov 164, 321*
World Cup Soccer, *Sep 176*
Gassée, Jean-Louis, *Jan 17, Jun 107*
Gates, Bill, *Jan 17*
Genealogy software, *Oct 27, Nov 321*
General Computer HyperCharger 020, ***Sep 132 r***
General Computer HyperDrive
Apple II conversion kit, *Mar 14*
FI-40, *Dec 108*
FX-20, *Jan 102, Dec 108*
FX-40, *Jan 102, Aug 174,* ***Nov 148 r,*** *Dec 108*
General Computer HyperTape, ***Aug 128 r***
Geometry, ***Feb 157 r***
GetInfo FKey, *Jul 203*
Giga Cell, *Oct 174*
Glue, site licensing for, *Jan 13*
Go, *Sep 175, Dec 118*
Golf, *Sep 93*
Gone Fishin' DA, ***Apr 156,*** *177*
GPIB-PRL, *Dec 159*
GPIB-SE, *Jul 170*
Graham Speller, *Dec 159*
Grammar checkers. *See* Style checkers
Grant Manager, *Nov 267*
Graphic Astrology, *Mar 93*
Graphics. *See also* Clip art; Cricket Draw; FullPaint; MacDraft; MacDraw; MacPaint; SuperPaint
Adobe Illustrator, *Jan 73,* ***Jun 116 r,*** *Aug 193, Nov 126*
Apple graphics card, *Apr 133*
Art Grabber+, *Oct 187*
bit-mapped, *Aug 194*
buyer's guide, *Nov 204*
Canvas, *Aug 11, Oct 173*
CheapPaint DA, ***Jan 96 r,*** *Aug 120, Oct 187*
color added to 3-D programs, *Jul 14*
Comic Strip Factory, *Sep 247, Nov 43*
Crystal Paint, *Sep 175*
Dimensions, *Jun 105, Dec 96*
file transfer, *Aug 193*
GraphicWorks, *Sep 124*
Graphidex, ***May 158 r***
GraphPainter, *Nov 267*
Gridmaker, ***May 159 r***
ImageStudio (The Realist), *Jul 121, Sep 95, Nov 131,* ***Dec 138 r***
Inhouse Graphics Service, *Jul 99*
introduction to, ***Aug 193***
LaserPaint, *May 101,* ***Sep 155 r***
Lightspeed Color Page Layout System, *May 103, Sep 146*
Mac3D, ***May 108 r***
MacCalligraphy, *Aug 103*
MacModel, ***May 108 r***
MacSpace, *May 108*
newspaper graphics, ***Feb 131,*** *Apr 109*
object-oriented, *Aug 194*
Phoenix 3D, ***Jan 125 r***
PostScript vs. QuickDraw, *Aug 41, Sep 45, 108, Dec 11*
PowerPoint, ***Jun 152 r***
Pro3D, ***May 108 r***
presentation, *Aug 193*
Reggie, *Nov 268*
Scribbler DA, *Oct 187*
Space Edit, ***May 108 r, Jul 160 r***
terminal emulators, *May 134*
3-D, ***May 118 r,*** *Aug 193*
TribNet, *Apr 109*
Verbum magazine, *Jul 97*
Widgets, *Oct 182*
Yale graphic design department, *Nov 93*
GraphicWorks, ***Jan 96 r,*** *Apr 222, Sep 124*
Graphidex, ***May 158 r***

(continues)

GraphPainter, *Nov 267*
Grappler parallel printer cable, *Nov 11*
GrayPaint. *See* ImageStudio
Great Plains Accounting Series, *Mar 89,* ***Apr 165 r,*** *Aug 35, Oct 136*
Great Plains Network Manager, *Aug 167*
Grep-Wc DA, ***Sep 163 r***
GreyFonts, *Feb 13*
Gridmaker, ***May 159 r***
Griffin Terminal, *May 134*
Guide, ***Feb 142 r,*** *Mar 21, Jun 38, Nov 17*
Gunshy, *Sep 93*

H

hammer Hard Drive Series, *Nov 268*
Hard & Soft OuterCircle hard disks, *Dec 159*
Hard & Soft Silver Server 103, 145, *Dec 108*
Hardball, *Jul 57, Dec 118*
Hard Disk Partition, *Jul 126,* ***Aug 158 r***
Hard disks/mass storage, ***Jan 102, Dec 104.*** *See also* Disk/file management
Amcodyne PhD, *Jan 102, Dec 108*
Apple HD 20SC, *Jan 102,* ***Mar 140 r,*** *Apr 144, Dec 108*
Apple Hard Disk 40-SC, 80-SC, *Dec 108*
Apple Internal 20-SC, 40-SC, 80-SC, *Dec 108*
AST Fast-20, *Oct 174*
AST-2000, *Jan 102, Dec 108*
AST-4000, *Jan 102,* ***Jul 126 r,*** *Dec 108*
backup tips, *Feb 169*
Bering Industries Totem series, *Dec 108*
buyer's guide, ***Nov 224***
CMC HardMac series, *Jan 102*
CMS Enhancements Compact 20a, 40, *Dec 108*
CMS Enhancements High Capacity Series, *Dec 108*
CMS Enhancements MacStack 20, 40, 43, 80, *Dec 108*
CMS Enhancements Pro80-II/i and Pro 43-II/i, *Oct 176*
CMS Enhancements Pro Series, *Dec 108*
CMS Enhancements S240, ***Jul 126 r***
Cutting Edge 30, *Dec 108*
DC Systems Easy Drive series, *Jan 102*
DiskExpress disk manager, ***Feb 156 r***
DiskInfo, *Oct 187*
Ehman Engineering HDD-20, *Jan 102*
Ehman Engineering HD-20, HD-40, *Dec 108*
EMAC, *Dec 159*
Everex EMAC series, *Dec 108*
Fastback, *Dec 159*
Find File utility, *Jan 13*
Franklin Telecom MacTwenty, *Oct 174*
FWB Software hammer series, *Dec 108*
General Computer HyperDrive FI-40, *Dec 108*
General Computer HyperDrive FX-20, *Jan 102, Dec 108*
General Computer HyperDrive FX-40, *Jan 102, Aug 174,* ***Nov 148 r,*** *Dec 108*
hammer Hard Drive Series, *Nov 268*
Hard & Soft OuterCircle, *Dec 159*
Hard & Soft Silver Server 103, 145, *Dec 108*
Hard Disk Partition, ***Aug 158 r***
head parking, *Sep 192*
HFS Locator, *Oct 187, 237*
IBNC 20, 40, 80, *Dec 108*
IBNC 40 Internal, *Dec 108*
interleaving, *Dec 108*
internal, *Aug 12, Oct 176*
Iomega Bernoulli Box series, *Jan 102, Dec 108*
Jasmine BackPac, *Aug 174, Dec 108*
Jasmine Direct Drive 20, *Jan 102, Dec 108*
Jasmine Direct Drive 50, ***Nov 148 r,*** *Dec 108*
Jasmine Direct Drive 80, *Jan 102,* ***Jul 126 r,*** *Dec 108*
Jasmine InnerDrive 90/II, *Dec 108*
Jasmine MegaDrive, *Aug 177, Sep 93, Dec 108*
Jasmine SCSI Hard Disk Series, *Aug 177*
Kamerman Labs Cirrus 21D, *Jan 102*
LaCie Cirrus series, *Dec 108*
LaCie Slot Machine series, *Dec 108*
Levco OverDrive 20, 40, *Dec 108*
LoDown Combo series, *Jan 102*
LoDown series, *Jan 102, Dec 108*
MacMemory internal, *May 13*
MacProducts USA Magic 20 series, *Dec 108*
MacTree, *Mar 97*
Magic Products Magic20, ***Sep 166 r***
Mass Micro Systems Mass 20, 40, 65, *Dec 108*
MDIdeas HD-20, HD-30, *Jan 102*
MDIdeas HDT-30/40, *Jan 102*
Micah AT series, *Jan 102, Dec 108*
Micah XT series, *Jan 102, Dec 108*
MicroTech International microMAC 30, 45, *Dec 108*
MicroTech International Nova 20, 30, 50, *Dec 108*
Mirror Technologies 30MB, 40MB, *Aug 12*
Mirror Technologies 50 II, 80 II, *Dec 108*
Mirror Technologies 300 SE, 450 SE, *Dec 108*
Mirror Technologies MagNet 40X, *Jun 180, Dec 108*
Mirror Technologies MagNet 172x, ***Jul 126 r***
Mirror Technologies MagNet series, *Jan 102, Dec 108*
Northern Telecom Memory Bank 261, 485, *Dec 108*
Northern Telecom SS400/Mac261, ***Jul 126 r***
NuData Data Cell series, *Dec 108*
NuData Giga Cell series, *Oct 174, Dec 108*
overview, ***Jul 126, Dec 104***
Palo Alto Microsystems WhisperDrive, *Jan 102, Dec 108*
PCPC MacBottom HD45, ***Nov 148 r***
PCPC MacBottom SCSI, *Jan 102*
PCPC MacBottom series, *Dec 108*
Peachtree S-20+, *Jan 102*
Peak Systems Plus series, *Jan 102, Dec 108*
Peak Systems Plus-20, ***Sep 166 r,*** *Dec 108*
Peak Systems Sierra series, *Jan 102*
Peripheral Land Infinity, *Oct 174, Dec 108*
Peripheral Land MacFast series, *Jan 102*
Peripheral Land MacStore 10, *Jan 102*
Peripheral Land PL series, *Jan 102, Aug 177, Dec 108*
Peripheral Land PL Turbo series, *Dec 108*
Peripheral Land PL172, ***Jul 126 r***
PowerUp, *Dec 159*
Priam Systems Division MacDisk series, *Sep 176, Dec 108*
Primary Data Pro 20 series, *Dec 108*
ProApp series, *Jan 102, Dec 108*
Rabbit Industries Magic series, *Jan 102*
Racet Computers Administrator I, II, *Dec 108*
Relax Technologies HardPlus series, *Dec 108*
Relax Technologies Hard 20 Plus, *Jan 102, Dec 108*
Relax Technologies MacMate series, *Dec 108*
Relax Technologies MacMate 20, *Jan 102, Dec 108*
Relax Technologies MiniMate 20, 30, *Dec 108*
Relax Technologies Relax SI series, *Dec 108*
Rely Drive series, *Sep 182, Dec 108*
Rodime 45 Plus, ***Nov 148 r***
Rodime 1400RX, *Dec 108*
Rodime HDI (II), *Dec 108*
Rodime Plus series, *Dec 108*
Rodime RX series, *Oct 176, Dec 108*
SCSI, *Jan 102, Apr 14*
Softworks SD series, *Jan 102*
Spectra Micro Development Hard Disk 20, *Jan 102*
Spectra Micro Development Spectra Drive series, *Dec 108*
Sunol Systems Sunstreak SCSI series, *Jan 102, Dec 108*
Sunol Systems SunStreak SCSI-245, ***Jul 126 r,*** *Dec 108*
SuperMac Technology DataFrame 40-XP, ***Apr 164 r***
SuperMac Technology DataFrame series, *Jan 102, Dec 108*
Supra Corporation SupraDrive series, *Jan 102, Dec 108*
Totem Bernoulli Drive Series, *Jun 180*
Trimar Generic Drive 20, *Jan 102*
Univation AS series, *Jan 102*
utilities, *Jan 13*
Warp Nine P20i, 30i, 45i, *Dec 108*
Warp Nine Photon series, *Jan 102, Dec 108*
Western Computer Big Mack Twin Pack, *Jan 102*
HardMac series hard disks, *Jan 102*
Hawkins, Trip, *Jan 17*
Hayes Smartmodem 2400, ***Jul 138 r***
HB Music Engraver, *Nov 267*
HD Backup, *Feb 169*
Hearts, *Sep 93*
Hebrew CalendarMaker, *Sep 175*
Hebrew word processor, *May 126, Sep 31*
HEC-2, *Jun 171*
Helix
DEC VAX version, *Jan 14, Dec 112*
VMX, *Jan 13, 14, Oct 130*
Help files, creating, *Aug 101*
Help DA, *Aug 101*
HelpFileMaker, *Aug 101*
Hertzfeld, Andy, interview, *Feb 73*
HFS, screen representation for, *Jan 166*
HFS Backup, *Feb 169*
for AppleShare, *Jul 167*

HES Find, *Aug 101*
HFS Locator, *Oct 187, 237*
Hieroglyphic fonts, *Jun 99*
HMS Mortgage Loan Calculator, *Aug 93*
Holy Bible, digitized, *Dec 159*
Hookup, *Jan 79*
Hugger, *Jun 182*
Hughes Aircraft, use of Mac at, *Feb 105*
HUMBLE, *Apr 119*
Hyper-C, *Oct 142*
HyperCard, *Sep 12,* ***Oct 122 r, Nov 17***
Business Class, *Dec 159*
courseware, *Dec 77*
Macworld contest, *Nov 12, Dec 79*
to do list, ***Dec 191***
videodisk tours, *Dec 79*
VideoWorks link, *Nov 103*
Hypercharger 020 coprocessor, *Jul 170*
HyperDrive. *See* General Computer HyperDrive
Hypertext, *Feb 142, Mar 21, Jun 38, Nov 17*
Hyphenation
DA, ***Jan 135 r***
Mac-Hy-phen, ***Jan 135 r,*** *Jun 35*
LetraHyphen, *Jun 35*
WorksPlus Spell, *Mar 97*

I

IBM PC. *See also* IBM PC-Mac file transfer
AST coprocessor, *May 67*
connecting ImageWriter to, *Jan 165*
connecting ImageWriter II to, *Aug 181*
connecting LaserWriter to, ***Sep 164***
Mac-like desktop, *Jul 19*
running MS-DOS programs on other computers, *Feb 105*
IBM PC-Mac file transfer, *Mar 13, Apr 14, 144, 150, May 13, 113, Aug 108, Oct 130, Dec 71*
Apple File Exchange, *Aug 108*
DaynaFile, *Sep 11, Nov 268*
dbMan-Mac, *Jun 171*
Ethernet adapter board, *Aug 11*
Mac86 card, *Jul 170*
Mac + PC, *Sep 178*
MatchMaker interface card, *Dec 159*
QuickShare, *Dec 159*
SoftPC, *Oct 12*
Touch OSI, *Sep 97*
IBM terminal emulators, *May 139*
IBNC 40 Internal hard disk, *Dec 108*
IBNC 20, 40, 80 hard disks, *Dec 108*
Icon Switcher, ***Apr 156,*** *Oct 36*
Icon-It, *Nov 267*
Icons
creating custom, *Apr 156, Oct 36, 97, 99*
editing, *Feb 164*
Iconstructor, *Oct 97*
Idea processors. *See* Outliners
Idealiner, *Nov 321*
IDVToolkit, *Jul 167*
IGES translators, *Apr 13, Dec 96*
Iggy Iggopolis, *Sep 93*
Illustrator. *See* Adobe Illustrator
Image Grabber digitizer, *Nov 270*
ImageMaker, *May 13, Jun 107, Sep 182*
Image processing
Digital Darkroom, *Dec 11*
ImageStudio (Realist), *Jul 121, Sep 95, Nov 131,* ***Dec 138 r***
Image Scanner, *Jun 180*
ImageStudio (Realist), *Jul 121, Sep 95, Nov 131,* ***Dec 138 r***
ImageWriter
avoiding paper jams, *Dec 214*
avoiding squashed lines at top of page, *Mar 164*
carrying bag, *Jun 180*
command codes, *May 176*
connecting to IBM PC, *Jan 165*
converting printouts to LaserWriter, *Jun 221*
printing envelopes on, *Mar 159*
setting narrow margins, *Aug 181*
spoolers, ***Mar 173***
squashed lines, *Jul 177*
ImageWriter LQ, *Oct 87*
ImageWriter II
attaching to IBM PC, *Aug 181*
power requirements, *Sep 187*
printing color on, *Feb 97*
squashed lines, *Sep 196*
Imagizer, *May 103*
color separations, *Nov 131*
Immortality, *Oct 91*
InBox, ***Feb 141,*** *Aug 108*
Information Institute, *Mar 21*
In-House Accountant, *Sep 175,* ***Nov 162 r***
Inhouse Graphics Service, *Jul 99*
Init files, *May 105, Oct 187*
Immortality, *Oct 91*
JClock, *Aug 120, Sep 194, Oct 187, Nov 99*
Startup Desk, *Oct 187*
Init FKey, *Jul 203*
inLarge, ***Aug 162 r***
Inside Macintosh, *Jul 97*
Inside Macintosh Library, *Aug 99*
Insight, *Oct 136*
Inspector, *Aug 174*
Installer, *Dec 209*
inTalk, ***Aug 160 r***
Interactive video, *May 103*
InterBridge, ***Jun 157 r***
Interface, future of Mac, *Aug 41*
Interleaf, *Oct 93*
InterMail, ***May 154 r;*** *Aug 108*
Interrupt switch, *Apr 183*
inTouch, *May 134*
Investment programs. *See* Stock market programs
Investor, *Jan 203, Apr 111*
Investor 2000, *Aug 93*
Iomega Bernoulli Box series, *Jan 102, Dec 108*
IRCAM, *Apr 121*
Isgur Portfolio System, *Jan 203, Apr 111*

J

Jain, Ash, interview, *May 67*
Jam Box/4, *Aug 177*
Jam Factory, *Aug 138, Nov 95*
Japanese kanji font, *May 13*
Japanese Mac, *Feb 13, Nov 280*
Jasmine hard disks
BackPac, *Aug 174, Dec 108*
Direct Drive 20, 80, *Jan 102, Dec 108*
Direct Drive 50, ***Nov 148 r,*** *Dec 108*
Direct Drive 80, ***Jul 126 r,*** *Dec 108*
InnerDrive 90/II, *Dec 108*
MegaDrive, *Aug 177, Sep 93, Dec 108*
SCSI Hard Disk Series, *Aug 177*
Jasmine Monochrome Video Board, *Aug 177*
JClock, *May 105, Aug 120, Oct 187, Nov 99*
removing, *Sep 194*
Jenkins, Kevin, *Jan 17*
Jetreader, *Mar 135*
J.K. Lasser's Your Income Tax, *Feb 189*
Jobs, Steve, on desktop publishing, *Feb 103*
Juggler, *Jul 13. See also* MultiFinder
Julia, *Mar 91*
Just Text, *Sep 124*

K

K, defined, *Jan 175*
K-Spool, *Oct 173*
Kahn, Philippe, interview, *Oct 67*
Kaleidoscope, *Mar 95*
Kamerman Labs, *May 13, Jul 13*
Cirrus 40T tape drive, *Jan 102,* ***Aug 128***
Cirrus 21D, *Jan 102*
KanjiTalk, *Feb 13*
Kawasaki, Guy, interview, *Aug 69*
Kay, Alan, *Jan 75*
Keyboards
buyer's guide, ***Nov 244***
cleaning, *Jul 185*
Datadesk, *Aug 53*
Extended, *Sep 65*
KeyString, *Jul 203*
long phone-cable connection, *Aug 190*
Mac-101, ***Oct 153 r***
Mac II and SE, *Apr 144*
new characters on SE, *Dec 212*
PC MacKey, ***Oct 153 r***
standard, *Sep 65*
upgrade, *Aug 53*
KeyCaps DA, displaying, *Nov 273*
Kieran, *Aug 167*
Kildall, Gary, *Jan 17*
King of Chicago, *Apr 121,* ***Jul 152 r***
Klondike, *Sep 93*
Knight-Ridder, use of Mac by, ***Feb 131***
Knockout DA, *Aug 120, Oct 187*
Kroy Color, *May 107*

(continues)

L

LabVIEW, ***May 155 r***
LaCie Cirrus series hard disks, *Dec 108*
LaCie Slot Machine series hard disks, *Dec 108*
Languages. *See* Programming
Lap-Mac, *Feb 122*
Laptop Macs, *Feb 13,* ***120,*** *Jun 38, Sep 11*
Large screens. *See* Monitors
Laser Author update, *Apr 222*
LaserCard, *Dec 79*
Laser Connection PS Jet printer, ***Jun 122 r,*** *Dec 77*
LaserFeeder, *Jan 185*
LaserKey, *Jul 203*
LaserKey Installer, *Feb 163*
LaserPaint, *May 101,* ***Sep 155 r***
color separation, *Nov 126*
LaserPerfect fonts, *Jun 40*
Laser printers. *See* LaserWriter; Printers
LaserScan, *Mar 135*
LaserScript, ***Sep 164 r***
LaserServe, ***Jun 142 r***
LaserSpeed, *Mar 13,* ***Jun 142 r,*** *171*
LaserSpool, ***Jun 142 r***
LaserStatus DA, *Aug 120*
LaserView, ***Jul 108***
LaserWriter
accelerator card, *Oct 97*
Blue Whale Accelerator Board, *Nov 268*
bug report, *Oct 12*
color output, *May 107*
connecting Mac to without AppleTalk, *Apr 178*
connecting to IBM PC, ***Sep 164***
emulating printout on screen, *Aug 116*
fonts, *Jan 185*
generating PostScript file, *Jan 185*
manual feed instructions printout, *Sep 190*
margin adjustment tip, *Oct 182*
memory upgrade, *Oct 97*
online bulletin board, *Jan 185*
output corresponding to ImageWriter, *Jan 185*
paper tips, *Jan 185, May 38*
power requirements, *Sep 187*
print area, *Jan 185*
printing screen dump to, *Feb 163*
sending PostScript files to, *Jan 185*
shareware fonts, *Oct 87*
skipping test page, *Jun 188, Dec 216*
spoolers, *Mar 13,* ***173, Jun 142 r***
tips, ***Jan 185, Jun 221***
transparencies, *Jan 185*
LaserWriter Reset, *Jul 93*
Launch DA/FKey, *Nov 99*
Layout, *Oct 97*
Lead, *Oct 174*
LearnWord, *Jun 171,* ***Dec 142 r***
Leary, Timothy, *Apr 21*
Leather Goddesses of Phobos, ***Aug 159 r***
Leisure Suit Larry in the Land of the Lounge
Lizards, ***Dec 142 r***
LetraHyphen, *Jun 35*
LetraPage, *Mar 13. See also* MacPublisher II
Levco, purchased by SMS, *Dec 12*
Levco Prime, *Apr 150*
Levco Prodigy SE, ***Sep 132 r***
Lighthouse, *Aug 11*
Lightspeed Color Page Layout System, *May 103,* ***Sep 146***
Lightspeed Pascal, ***Feb 125 r,*** *Oct 142*
Linkware Mac Connection, *Sep 175*
LISP, *Oct 142*
Coral Lisp, *Jan 13*
ExperCommonLISP, *Jan 13*
List, *Oct 174*
Listen, ***Dec 148 r***
Lithographer, *Nov 97*
Living Videotext
David Winer interview, *Jul 73*
purchased by Symantec, *Oct 11*
LockOut, *Jul 93*
LoDown Combo series hard disks, *Jan 102, Dec 108*
LoDown hard disks, *Dec 108*
LoDown T-20 tape drive, *Jan 102,* ***Feb 151 r***
LogicWorks, ***May 162 r***
Look-and-Feel copyright decision, *Jan 14, May 19, Jun 57*
LookUp, ***Dec 146 r***
Lottomation, *Jul 167*
Lotus, look-and-feel lawsuits, *May 19*
LSP300 scanner, *Mar 135*
Lurking Horror, *Sep 175*
LZR-2665 printer, ***Jun 122 r***

M

MacADIOS, ***Jul 150 r***
Mac-a-Mug, *Aug 101*
MacAdvantage, *Oct 142*
MacAPL, *Sep 175, Oct 142*
McAssembly, *Oct 142*
MacAtlas, ***May 166 r,*** *Dec 159*
MacBack +20, +60, *Jan 102*
Macintosh Bible updates, *Mar 97*
MacBillboard, ***Jan 96 r***
MacBottom SCSI hard disk, *Jan 102*
MacBrain, *Nov 103*
MacBreeze, *Jul 185*
McCAD PCB, ***Feb 155 r,*** *Jul 34*
MacC and Toolkit, *Oct 142*
Mac C Jr., *Mar 14, Oct 142*
MacCalligraphy, *Aug 103*
MacCharlie, *Aug 108*
MacChimney, *Oct 179*
MacCircles BBS, *Sep 229*
MacCOBOL, *Sep 40*
MacCOGO, *Dec 12, 159*
MacDesk, *Jul 174*
MacDraft, *Aug 193*
improving print quality, *Dec 214*
update, *Feb 198*
MacDraw, *Aug 193*
architects' use of, *Jul 132*
desktop publishing tips, ***May 203***
large font sizes, *Oct 179*
pointer tip, *Dec 212*
Sizer and Adjacency DA, ***Mar 150 r,*** *Jul 132*
text alignment, *May 171*
tips, *Feb 134*
update, *Dec 243*
Mac86 card, *May 113, Jul 170*
MacEnhancer, distribution by SoftStyle, *Jan 13*
MacEqn, ***Jan 133 r***
Mac factory, *Apr 115*
MacFast series hard disks, *Jan 102*
MacFax, *Dec 11*
MacFill-In update, *Feb 198*
MacFind, *Jun 35, 171*
MacFlow, ***Mar 149 r***
MacFORTH Plus, *Oct 142*
MacFractal, *Mar 91, Aug 28*
MacGeorge, ***Jul 153 r***
Mac-Hy-phen, ***Jan 135 r,*** *Jun 35*
Mach 2, *Jun 172,* ***Sep 161 r,*** *Oct 142, 237*
MacInHebrew, *May 171*
MacInTax, *Feb 189,* ***Mar 141 r***
MacInTax Planner, *Aug 167*
Macintizer, ***Mar 143 r***
Macintosh 512KE, demise of, *Nov 12*
Macintosh Pascal, *Oct 142*
Macintosh Plus, keyboard compatibility with older Macs, *Jan 165*
Macintosh Programmer's Workshop, *Sep 95 Oct 142, 146*
Macintosh SE, ***Apr 140 r, May 112 r***
accelerator cards, ***Sep 132,*** *Nov 151*
commentary, ***Sep 65***
GPIB interface, *Jul 170*
large monitor for, *Aug 12*
new characters on keyboard, *Dec 212*
problems with, *Oct 91*
third-party internal drives, *Jul 14*
unneeded Systems and Finders problem, *Nov 11*
Macintosh II, ***Apr 126 r***
compared to other workstations, ***Nov 136***
compatibility of existing software, *Jul 13*
design of, *May 55*
industrial housing, *Dec 73*
memory upgrade tips, ***Dec 235***
monitors, ***Jul 108, Dec 90***
overview, ***Jun 130***
problems with, *Oct 91, Nov 61*
RAM size, *Jun 75*
software compatibility, *Nov 108*
MacInUse, ***Jul 158 r,*** *Nov 321*
MacKermit terminal emulation, *May 134*

MacLightning, *Aug 120,* ***Oct 114 r,*** *187*
name changed to Mentor, *Sep 248*
MacLine, *May 134*
MacLink, ***Apr 163 r***
MacMail Telecom terminal emulation, *May 134*
MacMainframe, *May 134*
MacMainFrame DX gateway, *Aug 226, Oct 130*
MacMainFrame SE, *Jul 170*
Mac Man, ***Jun 159 r,*** *Oct 237*
MacMate 20, *Jan 102*
MacMathPac, ***Jul 159 r***
MacMemories, ***Mar 147 r***
MacMemory internal hard disks, *May 13*
MacMemory MaxPlus, ***Mar 144 r,*** *Apr 14*
MacMemory multifunction board, *Jan 14*
MacMETH, *Oct 142*
MacModel, ***May 108 r***
MacModula-2, *Oct 142*
MacMoney, ***Nov 152 r***
MacMovies, *Feb 14, Mar 53,* ***105 r,*** *Nov 11*
Mac 'N Med, *Nov 267*
MacNail, *Nov 267*
MacNIX, *Feb 102*
MacNosy update, *Dec 243*
MacOCR, *Jul 170*
MacOilie, *Dec 159*
Mac-101 keyboard, ***Oct 153 r***
Mac Pro Football, *Jan 81,* ***Jul 157 r,*** *Nov 38*
MacProducts USA Magic 20 series hard disks, *Dec 108*
MacPacq, *Sep 178*
MacPaint, ***Jan 96 r,*** *Aug 193*
Print Catalog, *Oct 182*
reducing images in MacDraw, *Jan 185*
remote-control lasso, *Jul 180*
tips, ***Feb 177***
MacPak, *Apr 150*
MacPerspective, *Jul 132*
MacPlot, *Jul 132, Oct 237*
MacPlots II, *Jul 132*
Mac + PC card, *Sep 178*
MacPort+, ***Feb 154 r***
MacProject update, *Dec 243*
MacProof, ***Mar 151 r,*** *Aug 95*
MacPS, *Oct 173*
MacPublisher II (LetraPage), ***Jan 112***
MacPublisher III, *Jul 14,* ***Dec 139 r***
MacQueue BBS, *Sep 229*
MacRacquetball, *Oct 173,* ***Nov 154 r***
MacRecorder kit, *Mar 167*
MacRepertory, *Jul 167*
MacRobots, ***Nov 160 r***
MACropedia BBS, *Sep 229*
Macros
AutoMac II, *Aug 138,* ***Nov 159 r***
Microsoft Excel, ***Nov 122,*** *273, Dec 209*
Microsoft Excel Close&Save, *Dec 209*
Microsoft Works, *Dec 69*
QuicKeys, *Dec 75*
Tempo, *Jun 14, Oct 187*
MacRun, *Oct 173*
MacSafe, ***Jun 166 r,*** *Oct 36, Dec 243*
MacScan digitizer, *Feb 107,* ***Jul 116 r,*** *Dec 243*
MacScheme, *Apr 34, Oct 142*
MacServe, *Mar 48, 114, Aug 108*
MacShammes, *Aug 167*
MacSmarts, *Aug 37*
MacSpace, *May 108*
MacSpec, *Mar 198,* ***Aug 156 r***
MacSpeech Lab, *Jul 150*
MacSpell+ update, *Feb 198*
MacSpin, performance on large screen, *Jun 40*
MacSS, *Sep 175*
MacStack, *Jul 174*
MacTablet, ***Mar 143 r***
MacTAG (Teacher's Assistant Grader), *Jun 172*
MacTerminal, *May 134, Dec 243*
MacTEX, *May 216, Sep 124*
Mac the Knife 4 and 5, *Dec 159*
Mac3D, *Jan 212,* ***May 108 r,*** *Aug 97*
color version, *Jul 14*
MacTilt SE, *Aug 179, Nov 97*
MactoGS Assembler Linker, *Jan 13*
MacTran77, *Oct 142*
MacTree, *Mar 97*
Mac Tutor, *Sep 40*
Mac240 terminal emulator, *May 134, Oct 130*
Mac286 card, *Jul 172*
Mac2624 terminal emulator, *Jan 38*
MacTut, *Jun 99*
MacVision, ***Mar 133 r***
MacWait, ***Apr 156,*** *May 105*
Macworld Buyer's Guide, *Nov 174*
Macworld index, disk-based, *Jun 35, 171*
MacWrite
altering default settings, *Dec 209*
footnote tip, *Feb 167*
M.A.G.I.C. BBS, *Sep 229*
Magic series hard disks, *Jan 102*
Magic20 hard disk, ***Sep 166 r***
Magnifier, *Nov 270*
Magnum Tape 40, *Jun 180*
Mail merge, ***Sep 140***
MergeWrite, *Aug 170,* ***Dec 151 r***
Mail-order software, *Feb 53,* ***Mar 126,*** *Dec 39,* ***Dec 82***
Maintenance tips, *May 107,* ***Jul 185,*** *Oct 176, Nov 166*
Mandelbrot, *Mar 91*
Mandelzoom, *Mar 91*
Map-creation software, ***May 166 r***
EarthPlot, ***May 166 r***
MacAtlas, ***May 166 r,*** *Dec 159*
MapMaker, *Apr 222,* ***May 166 r***
MiniCad mapping module, *Feb 95*
in newspapers, *Feb 131*
weather maps created on Mac, *Feb 107*
Margins, setting narrow, *Aug 181*
Market Master, *Aug 28, 170*
Market Pro, ***Jan 124 r, 203,*** *Apr 111*
Mass Micro Systems Mass 20, 40, 65 hard disks, *Dec 108*
MasterFORTH, *Oct 142*
Masterpiece, *Oct 157 r*
MasterTracks, *Jun 172, Aug 138*
MasterWorks, *Nov 267,* ***Dec 142 r***
Math Blaster, ***Apr 172 r***
Mathematics Arithmetic, Algebra, MacFunction, *Nov 267*
Eureka: The Solver, *May 14, Aug 167*
Expressionist equation editor, *Jun 171*
MacMathPac, ***Jul 159 r***
Math Blaster, ***Apr 172 r***
MathFract fonts, *Jul 167*
MathType, *Aug 95, 170*
MathView Professional, *Dec 159*
MathWriter, *Apr 117*
PowerMath, ***May 163 r***
Scientific Desk, *Aug 170*
MathFract fonts, *Jul 167*
MathType, *Aug 95, 170*
MathView Professional, *Dec 159*
MathWriter, *Apr 117*
MaxThink, *Dec 124*
Maze Wars, ***Oct 151 r***
MDIdeas HD-20, HD-30, *Jan 102*
MDIdeas HDT-30/40 hard disk, *Jan 102*
MDIdeas TDBK-20+, tape drive-45, *Jan 102,* ***Feb 151 r***
measureUP, ***Jan 134 r,*** *Apr 222*
Medical applications, *Sep 31*
HeartLab, *Aug 167*
Mac 'N Med, *Nov 267*
Medical Dictionary for Spellswell, *Aug 170*
office-management software, *Jan 81*
Quick Ceph, *Aug 170*
Surgeon, ***Mar 154 r***
UCSF surgery simulation, *Dec 79*
user group, *Sep 31*
MegaScreen, ***Jan 88 r,*** *Apr 14,* ***Jul 108,*** *Oct 237*
Memorandum, *Mar 14, Jun 172*
Memory upgrades. *See* Upgrades
Mentor, *Sep 248*
MenuFonts DA, *Aug 170, Sep 11*
Menus, shortening titles of, *Mar 169*
MergeWrite, *Aug 170,* ***Dec 151 r***
Merriam Webster Thesaurus for Microsoft Word 3.0, *Jul 167*
MFS, *Apr 215*
MGMStation, *Jul 31, Nov 43,* ***114,*** *Dec 96*
IGES translator, *Apr 13*
symbol libraries, *Dec 159*
use of by architects, *Jul 132*
MI-4 board, *Jun 103*
Micah AT and XT series hard disks, *Jan 102, Dec 108*
Micah Storage Systems, *Aug 12*

(continues)

Not all reviews are created equal.



Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. MACWORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want.

Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices. MACWORLD, The Macintosh™ Magazine.

MACWORLD GIVES YOU MORE.

MACWORLD

SUBSCRIBE NOW!
SAVE $23.40 OFF THE ANNUAL COVER PRICE

Limited-time offer! Take advantage of Special Savings
Call TOLL FREE 800/524-3200
Visa and MasterCard Accepted

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE. ☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME_____

COMPANY_____

TITLE_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only.

MACWORLD

4BQA2

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE. ☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME_____

COMPANY_____

TITLE_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only.

MACWORLD

4BQA2

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

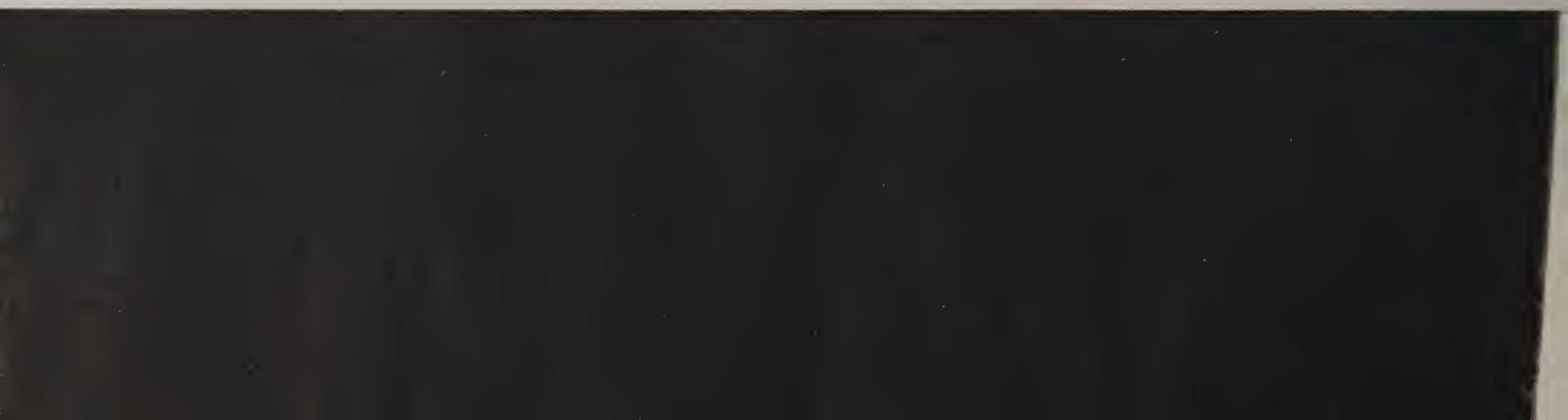
NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666



Micah TB 40/60 tape drive, *Jan 102*
Mickey Mouse clock DA, *Oct 187*
MicroChem, ***Jun 154 r***
Microcom AX/9624c modem, ***Jul 138 r***
Micro In-ATE, *Oct 173*
MicroLeague Baseball, *Jul 57*
MicroPhone
bundled with AST modems, *Apr 13*
line breaks, *Aug 185*
terminal emulation, *May 134*
update, *Sep 248*
Micro Planner Project Exchange, *Mar 13, Jul 167*
Micro Planner Project Plotter, *Mar 13*
MicroScrabble, *Jul 167*
Microsoft BASIC
Compiler, *Feb 14,* ***May 143 r,*** *Oct 142*
degrees, minutes, seconds to decimal, *Sep 187*
filled polygon, *Jan 168*
Interpreter, *Oct 142*
printing various fonts in, *Jun 187*
rounding numbers, *Apr 177, Sep 187*
space-saving tip, *Aug 190*
Microsoft Excel
Close&Save macro, *Dec 209*
column adjustment macro, *Jun 190, Nov 273*
Excellent Exchange templates and macros, *Jun 171*
lining up decimal points in, *Jul 179*
MacNail template, *Nov 267*
macros, *Jun 171,* ***Aug 151 r,*** *188,* ***Nov 122***
MacRun template, *Oct 173*
mail merge template, *Sep 140*
retaining worksheet formatting when copying to Word, *May 171*
SELECT macro, *Aug 188*
tax preparation templates, *Feb 189*
templates, *Feb 189, Jun 171,* ***Aug 151 r,*** *167, Sep 140, Oct 173*
tips, ***Mar 191***
tutorials, ***Dec 142 r***
update, *Sep 248*
Microsoft FORTRAN, *Oct 142*
bugs, *Feb 46*
Microsoft Word, ***Oct 225.*** *See also* Microsoft Word 3.0
avoiding unwanted page breaks, *Jul 181*
desktop publishing applications, *Sep 124*
glossary tips, *Jul 180*
mail merge, *Sep 142*
paragraph formatting tip, *Jul 180*
spelling checker, ***Oct 114 r***
tips, ***Mar 183***
tutorials, ***Dec 142 r***
Microsoft Word 3.0, ***Mar 116***
LearnWord 3.0 training course, *Jun 171*
outline view, *Dec 124*
Page Setup tip, *Dec 212*
preview, ***Mar 116***
style sheets, ***Oct 225***
text rotation program, *Sep 187*
tips, ***Sep 215***
update, *Oct 12*
Microsoft Works
macros, *Dec 69*
mail merge functions, *Sep 140*
Master Works tutorials, *Nov 267*
tips, ***Jul 195***
tutorials, ***Dec 142 r***
WorksPlus Spell, *Mar 97,* ***Nov 156 r***
MicroTech International microMAC 30, 45 hard disks, *Dec 108*
MicroTech International Nova 20, 30, 50 hard disks, *Dec 108*
Microtek MS-300A, ***Jul 116 r***
Microtek MS-300C, *Sep 178*
MIDI, *Jun 111, Aug 138,* ***Nov 283***
Jam Factory, *Aug 138, Nov 95*
M, *Nov 95*
MIDI Mac Sequencer, ***Mar 142 r***
MIDIPaint, *Nov 97*
One-Step, *Nov 95*
proposed standard, *Nov 95*
UpBeat, *Oct 174*
Migent Pocket Modem, ***Jul 138 r***
Mighty Finder, *Jan 195*
Mimeograph masters, printing, *Oct 180*
MindWrite, *Mar 38,* ***Apr 160 r,*** *Dec 124, 243*
MiniCad, ***Jun 158 r,*** *Aug 226,* ***Nov 114***
mapping module, *Feb 95*
use of by architects, *Jul 132*
MiniFinder, ***Jan 195***
miniWriter DA, *May 176,* ***Sep 163 r,*** *Oct 187*
printer codes in, *May 176*
Mirror Technologies hard disks
30MB, 40MB, *Aug 12*
50 II, 80 II, *Dec 108*
300 SE, 450 SE, *Dec 108*
MagNet 40X, *Jun 180, Dec 108*
MagNet 172x, ***Jul 126 r***
MagNet 340X, *Jun 180*
MagNet series, *Jan 102, Dec 108*
Mirror Technologies Magnum Tape 20, *Jan 102*
Mirror Technologies Magnum Tape 40, ***Aug 128 r***
MIT simulation projects, *Feb 21*
MockChart, *Aug 120*
MockPackage, *Oct 187*
MockTerminal, ***Apr 173 r***
MockWrite, *Sep 245, Oct 187*
printing tip, *Feb 167*
Model 730 scanner, *Mar 135*
Modems, ***Apr 187, May 181, Jul 138,*** *Sep 240. See also* Modem servers
AppleFax, *Oct 12*
Bizcomp IntelliModem 2400, *Oct 174*
Codex 2260, ***Jul 138 r***
download in background, *Oct 91*
EMACMD2400, *Dec 159*
Fastcomm 2496, ***Jul 138 r***
fax, *Oct 12, Nov 43*
Hayes Smartmodem 2400, ***Jul 138 r***
introduction to, *Apr 187*
Maxwell 1200VP, ***Jul 153 r***
Microcom AX/9624c, ***Jul 138 r***
Migent Pocket Modem, ***Jul 138 r***
NetModem V1200, *Oct 89,* ***Dec 145 r***
Novation Professional, ***Jul 138 r***
overview, ***May 181, Jul 138***
Parrot 1200, *Jul 174*
Racal 9600VP, ***Jul 138 r***
Shiva NetModem V1200, *Oct 174*
Solana Electronics, *Nov 43*
Telcor Accelerator, ***Jul 138 r***
Telebit Trailblazer, ***Jul 138 r***
tips, *Feb 166*
Volksmodem-Mac Plus connection, *Oct 182, 184*
Modem servers, *Feb 13, Nov 43,* ***Dec 145 r.*** *See also* Modems
C-Server, *Jul 141*
ComServe, *Jul 141, 171*
Infosphere, *Feb 13*
ModemShare, *Jul 141*
MultiTalk, *Jul 141*
R-Server, *Oct 176*
ModemShare, *Jul 141*
Monitors, ***Jan 88 r;*** *Apr 150,* ***Jul 108,*** *Dec 90. See also* Video cards
adding to SE, *May 113*
Apple High-Resolution Monochrome, ***Jul 108***
AppleColor High-Resolution RGB, ***Jul 108,*** *Dec 90*
color monitor comparison, ***Dec 90***
Cornerstone Vista 1600, *Oct 176*
E-Machines' Big Picture, ***Jul 108***
4SITE Machroma C2, *Dec 159*
introduction to, *Aug 194*
large-screen, ***Jan 88 r***
Mac II, ***Jul 108***
Micrographic Images MegaScreen, ***Jul 108,*** *Oct 237*
Micrographic Images MegaScreen SE, *Aug 12*
Nutmeg Full Page Display, *May 43, Jun 101, Jul 172*
PCPC II color graphics system, *Dec 90*
ProApp EyeSaver, *Dec 159*
Sigma Designs LaserView, ***Jul 108***
Sony CPD-1302, *Dec 90*
Stretch Screen Display, *May 43*
SuperMac 19-inch Color, ***Jul 108,*** *Dec 90*
SuperMac 19-inch Monochrome, ***Jul 108***
Taxan Multivision 770 Plus, *Dec 90*
Thomson 4375M, *Dec 90*
Monogram Exporter, *Aug 170*
More, ***Dec 124***
tips, ***Aug 205***
update, *Mar 14, May 216*
Mouse
cleaning, *Nov 166*
maintenance kit, *May 107*
pads, *Nov 166*

(continues)

Mouse Exchange BBS, *Dec 12*
Movies
CineWrite, *Aug 167*
Clicktrack, ***Sep 158 r***
colorization, Mac's involvement in, *Apr 111*
Cue, *Jun 111, Jul 167, Aug 138,* ***Sep 158 r***
Scriptwriter, ***Nov 156 r***
software, *Apr 13*
scoring, *Aug 138*
Moving Lines FKey, *Jul 203*
MPW, ***Sep 95,*** *Oct 142, 146*
C, *Oct 142*
compilers, *Sep 95*
Pascal, *Oct 142*
MS-DOS. *See* IBM PC-Mac file transfer
MSC/pal, *Apr 13*
MSP300 scanner, *Mar 135*
M.U.D., *Mar 13*
MultiFinder, *Sep 12, Oct 95,* ***108 r***
MultiTalk, *Jul 141, Aug 177*
MultiTalk MT-100 Port Server, ***Dec 145 r***
Multiuser Appointment Diary, *Oct 173*
Multiuser Desktop Accounting, *Oct 173*
Museums, use of Mac by, *Jul 99*
Music
Berklee College of Music, *Jun 109*
Clicktracks, ***Sep 158 r***
Cue, *Jun 111, Jul 167, Aug 138,* ***Sep 158 r***
Cybernetic Composer, *Aug 97*
Deluxe Music Construction Set, ***Mar 142 r***
Dyaxis A-to-D conversion system, *Aug 12*
file interchange standard, *May 14, Nov 95*
HB Music Engraver, *Nov 267*
introduction to, ***Nov 283***
IRCAM, *Apr 121*
Jam Box/4, *Aug 177*
Jam Factory, *Aug 138,*
Listen, ***Dec 148 r***
MasterTracks, *Aug 138*
Master Tracks Pro, *Jun 172*
MIDI Mac Sequencer, ***Mar 142 r***
Music Mouse, *Aug 138*
NAMM highlights, *Jun 111*
Opcode sequencer update, *Jun 111*
Performer, *Aug 138*
Practica Musica, *Aug 170*
Professional Composer, *Aug 138, Nov 276*
professional musicians' use of Mac, ***Aug 138***
SoftSynth, *Jun 111, Aug 138,* ***Oct 163 r***
Sound Designer, *Aug 138*
Studio Session, *Feb 101,* ***Nov 158 r***
UpBeat, *Oct 174*
Music Mouse, *Aug 138*
Muzzle security system, *Nov 97*
MX Plus portable Mac, *Feb 122*
myDiskLabeler update, *Mar 198*

N

NASA, Mac at Jet Propulsion Laboratory, *Sep 91*
National Semiconductor NS8/16 upgrade, *Oct 176*
Navigator, *Dec 67*
NB-GPIB, *Jul 172*
NB-MIO-16 I/O board, *Jul 172*
NEC SilentWriter LC-890, *Feb 14, Dec 77*
Neon, *Oct 142*
NetModem V1200, *Oct 89,* ***Dec 145 r***
NetTrek, *Sep 97*
Netway 1000, *May 134*
NetWay N1000A communications server, ***Nov 150 r***
Network Specialties Jump Board 020, *Sep 176*
Networks, ***Sep 199, Oct 130,*** *Nov 43*
AlisaTalk, *Oct 130*
Apple EtherTalk board, *Sep 12*
AppleShare, *Mar 53,* ***108 r,*** *Aug 108, Sep 11,* ***Oct 150 r***
AppleTalk, *Jan 75, Sep 199*
EicoNet, *Feb 13*
enhancing AppleTalk with Du Pont fiber optic cable, *Jan 75*
Ethernet adapter board, *Aug 11*
Ethernet controller, *Mar 14*
EtherTalk, *Oct 93*
FastNet, *Sep 12*
FastPath3, *Jun 180*
file servers, *Sep 199*
Great Plains Network Manager, *Aug 167*
IBM PC file transfer, *Aug 108, Oct 130*
InterBridge, ***Jun 157 r***
introduction to, ***Sep 199***
Mac/IP, *Sep 99*
MacMainFrame DX gateway, *Oct 130*
MacServe, *Jan 118, Aug 108*
MultiTalk, *Aug 177*
MultiTalk MT-100 Port Server, ***Dec 145 r***
multiuser games, *Jan 129, Aug 167, Sep 97, Oct 151*
multiuser page layout, *Aug 11*
NetModem V1200, *Oct 89,* ***Dec 145 r***
Netway N1000A communications server, ***Nov 150 r***
Neural, *Nov 103*
Nucleus Series network servers, *Jun 180*
overview, ***Oct 130***
PC MacBridge/AFP, *Jun 172*
pcLink, *Oct 130*
PhoneNet, *Oct 130,* ***Dec 136 r***
PhoneNet Star Controller, *Mar 13*
Pyramid Connection, *Jan 14*
servers compared, *Mar 114*
TangentShare, *Aug 108*
3Com 3+, *Aug 108, Nov 268*
3Server3 disk server, ***Jan 132 r***
TOPS, *Aug 108*
TOPS Repeater, *Jun 180*
TOPS Star, *Jun 180*
Touch OSI, *Sep 97*
Neural networks, *Nov 103*
Neuromancer, *Apr 21*
New Scrapbook, *Jul 93*
NeWS, *Nov 136*
Newspapers, Mac used in producing, ***Feb 131***
AP GraphicsNet, *Sep 91*
Christian Science Monitor, *Jun 111*
desktop-published, *Dec 73*
graphics guide, *Dec 11*
NewStudio, *Jul 132*
NFL Challenge, ***Jul 157 r;*** *Nov 36, 38*
NightWatch, *Dec 159*
Nord and Bert, *Dec 159*
Northeastern Software, commentary, *Feb 53*
Northern Telecom Memory Bank 261 and 485 hard disks, *Dec 108*
Northern Telecom SS400/Mac261, ***Jul 126 r***
Novastor Novatape 110, *Oct 176*
Novation Professional modem, ***Jul 138 r***
NSChart and NSPDL Language Translators, *Sep 175*
NTSC video, *Aug 11*
NuBus, *Apr 126, 129*
Nucleus Series network servers, *Jun 180*
NuData Data Cell series hard disks, *Dec 108*
NuData Data File tape drive, ***Aug 128 r***
NuData Giga Cell series hard disks, *Oct 174, Dec 108*
Nutmeg Full Page Display, *May 43, Jun 101, Jul 172*
NutriCalc Plus update, *Sep 248*
NYMUG, *Mar 63*

O

Oasis, *May 28, Jul 31*
Object Logo, ***Jun 162 r,*** *Sep 248, Oct 142*
Office Productivity System, ***Jun 164 r***
OfficeTalk, *Jul 167,* ***Sep 152 r***
OmniLaser 2108, *Feb 99,* ***Sep 157 r***
Omnis 3 Plus, building multiuser general ledger with, ***Jan 118***
Omnium Mouse Pad, *Oct 176*
1000 Miles, *Sep 93*
123Laser, *Sep 176*
Online information services, ***Apr 187.*** *See also* Bulletin boards
Air Warrior game, *Aug 167, Sep 97*
Buck, Wheat, & Associates, *May 14*
Desktop Express, *May 97, Sep 152,* ***Oct 154 r,*** *Nov 12*
FCC access fee, ***Sep 17***
Navigator, *Dec 67*
OfficeTalk, ***Sep 152 r***
Spectrum, *May 103*
X-Press Information Services, *Feb 99*
One + One upgrade, ***Mar 144 r***
One-Step, *Nov 95*
Opcode sequencer update, *Jun 111*
Optical character readers, *Jul 170*
Optical disks
LoDown, *May 43, 97*
recording sounds on, *Jun 13*

Optum-3, ***Oct 166 r***
OrbQuest, ***Feb 150 r***
Order House, *Jan 172*
Orion accelerator card, *Jan 180*
Other, *Jan 195, Jul 31, 177, Nov 99*
Outliners, ***Dec 124***
Acta, *Sep 36, Oct 187, Dec 124*
Calliope, *Feb 160 r, May 216, Dec 243*
Design, ***Feb 148 r***
Idealiner, *Nov 321*
MaxThink, *Dec 124*
MindWrite, *Dec 124*
More, *Mar 14, May 216,* ***Aug 205,*** *Dec 124*
Outlook, *Dec 124*
overview, ***Dec 124***
ThinkTank, *Dec 124*
Voila, ***May 164 r,*** *Oct 187, Dec 124*
Outlook, *Dec 124*
OverVue
tips, ***May 191***
update, *May 216*

P

Pacer pcLink, *May 134*
PacerPrint, *Jun 172*
Packit III, *Sep 245*
Page-layout programs. *See* Desktop publishing
PageMaker, *Sep 124. See also* PageMaker 2.0
Corporate Image templates, *Jul 167*
design competition, *May 99*
discounts for user groups, *Nov 12*
help files tip, *Mar 167*
PageMaker Portfolio, *Mar 95,* ***Jul 151 r***
PageTutor Series, *Oct 173*
shadow-style text in, *Jun 194*
templates, *Jan 13, Mar 95,* ***Jul 151 r,*** *Nov 268*
text-moving tip, *Jan 171*
tutorials, ***Dec 142 r***
update, *Oct 12*
PageMaker 2.0, ***Jan 112, Sep 150 r.*** *See also* PageMaker tips, ***Oct 203***
Page One, *Apr 14*
PageOne, *Mar 93*
PageTutor Series, *Oct 173,* ***Dec 142 r***
Paint Cutter, *Jan 187*
Paint programs, ***Jan 96 r***
Painted Mac cases, *May 105*
Palo Alto Microsystems WhisperDrive, *Jan 102, Dec 108*
PaperJet 400/XP Document Feeder, *Jul 172*
Parallel processing card, *Jun 103*
Parameter Manager, ***Jan 130 r***
Parrot 1200 modem, *Jul 174*
Password, *May 105, Jul 203*
Pathname FKey, *Jul 203*
Patton vs Rommel, *Feb 101,* ***Aug 151 r***
PC InBox, *Aug 108*
PC MacBridge/AFP, *Jun 172*
PC MacBridge/Plus, update, *Apr 222*
PC MacKey, ***Oct 153 r***
PC-380 Bar Code Reader, ***Apr 170 r***
PC-385 Bar Code Reader, *Dec 159*
PC Scan Plus, ***Jul 116 r***
PC Visor, *Jun 182*
PCB design, *Feb 155*
Douglas CAD/CAM, *Aug 167*
McCAD, *Jul 34*
pcLink, *Oct 130,* ***Nov 161 r***
PCMacBASIC, ***May 143 r,*** *Oct 142*
PCPC MacBottom series, *Dec 108*
MacBottom HD45, ***Nov 148 r***
MacBottom SCSI, *Jan 102*
PD FontEdit, *Oct 97*
Peachtree S-20 +, *Jan 102*
Peak Systems hard disks
Plus series, *Jan 102, Dec 108*
Plus-20, ***Sep 166 r,*** *Dec 108*
Sierra series, *Jan 102*
Peak Systems Orion card, ***Sep 132***
Peak Systems Plus-20T tape drive, *Jan 102*
Peak Systems Plus 60-Tape, ***Aug 128 r***
Perfect College update, *Mar 198*
PerfecTek MacPlusPC card, *Aug 108*
Performer, *Aug 138*
Peripheral Land hard disks
Infinity, *Oct 174, Dec 108*
MacFast series, *Jan 102*
MacStore 10, *Jan 102*
PL172, ***Jul 126 r***
PL series, *Jan 102, Aug 177, Dec 108*
PL Turbo series, *Dec 108*
Peripheral Land MacBack +20, +60 tape drives, *Jan 102*
Peripheral Land MacBack Plus 40 tape drive, ***Aug 128 r***
Peripheral Land PL20, PL30 Tough Drives, *Aug 177*
Personal Bibliographic System update, *Mar 198*
Personal Computer Achievement Awards, *Jan 17*
Personal LaserPrinter, ***Sep 108 r***
Personal Manager, *Nov 267*
Personal productivity software
CalendarMaker, ***Mar 152 r***
Personal RésuméWriter, *Apr 111*
TimeLink, ***Mar 153 r***
Personal RésuméWriter, *Apr 111*
Personal Writer, *Sep 176*
Phoenix 3D, ***Jan 125 r***
PhoneNet, *Oct 130,* ***Dec 136 r***
PhoneNet Star Controller, *Mar 13*
PhotoCalc, *Oct 173*
Photon 20, 30 hard disks, *Jan 102*
PhotoPhile, *Jun 172*
Phrase Craze Plus, *Sep 93*
Physics, *Jul 103, Oct 173*
PICT, defined, *Jan 175*
PictureBase update, *May 216*
PICTures clip art, *Nov 268*
PIXymbols One fonts, *Nov 268*
Plot-It update, *Jan 212*
Plus-Spooler, *Dec 159*
Point 'n' Click, *Aug 170*
Polarizing Filter, *Jul 185*
Portable Macs, *Feb 13, 120*
Colby WalkMac, *Nov 105*
Dynamac, *Feb 13*
Dynamac GP, *Sep 11*
Portal, ***Sep 160 r***
Portfolio management programs, ***Jan 203***
P.O.S./Mac Point-of-Sale, *Nov 268*
PostCode and Micro-Set, *Jun 172*
PostScript. *See also* PostScript graphics
adoption of by IBM, *May 14*
clones, *Dec 12*
Display PostScript, *Dec 11*
EPSF, *Sep 79*
Fontographer, *Apr 42*
future of, *Sep 79*
introduction to, ***Dec 171***
keystroke combo to generate file, *Jan 185*
origins of, *Sep 79*
printers, *Feb 14,* ***Jun 122 r,*** *Nov 29*
sending files to LaserWriter, *Jan 185*
Sun NeWS, *Nov 136*
text effects, *Mar 95*
text rotation program, *Sep 187*
vs. QuickDraw, *Aug 41, Sep 45, 108, Dec 11*
PostScript graphics. *See also* PostScript
Adobe Illustrator, *Jan 73,* ***Jun 116 r,*** *Aug 193, Nov 126*
color separations, ***Nov 126***
Cricket Draw, ***May 148 r,*** *Aug 193,* ***217,*** *Sep 124, Nov 126*
introduction to, *Aug 193*
LaserPaint, ***Sep 155 r,*** *Nov 126*
PowerDraw, *Nov 43*
PowerMath, ***May 163 r***
Power Miser, *Sep 12*
PowerPoint, *Apr 115,* ***Jun 152 r***
Power Port, *Sep 178*
PowerStation, *May 30, Sep 99,* ***Dec 150 r***
Power supply problems, *Mar 35*
Power Tools, *Nov 268*
PowerUp, *Dec 159*
Practica Musica, *Aug 170*
Priam Systems Division MacDisk series, *Sep 176, Dec 108*
Primary Data Pro 20 series hard disks, *Dec 108*
Princeton font, *Oct 87*
Print Shop, ***Apr 174 r***
look-and-feel decision, *Jan 14*
update, *Sep 248*
Printer Muffler, *Aug 179*

(continues)

Printers/printing. *See also* ImageWriter; ImageWriter II; LaserWriter; Spoolers
AST TurboLaser/PS, *Nov 270, Dec 77*
avoiding paper jams, *Dec 214*
buffers, *Mar 173*
buyer's guide, ***Nov 244***
choosing paper stock, *Aug 114*
color, *Sep 146, Nov 101*
color laser, *Nov 101*
Compugraphic CG 400-PS, *Aug 11*
connecting ImageWriter to IBM PC, *Jan 165*
Dataproducts LZR-2665, ***Jun 122 r***
DEC ScriptPrinter, *Dec 77*
Diconix Dijit 1/PS, *Feb 14*
disk labels on Cover-up tape, *Jun 188*
downloading fonts to LaserWriter, ***Feb 112***
Envelope DA, *May 14*
font cache, *Sep 108*
Grappler cable, *Nov 11*
HP PaintJet, *Nov 101*
IBM PC to LaserWriter, *Aug 108*
ImageWriter LQ, *Sep 12, Oct 87, Nov 101*
Installer, *Dec 209*
JDL-850 GL, *Dec 159*
Laser Connection PS Jet, ***Jun 122 r,*** *Dec 77*
laser printers compared, ***Jun 122 r***
LaserScript, ***Sep 164 r***
LaserStatus DA, *Aug 120*
mimeograph masters, *Oct 180*
MockWrite printing tip, *Feb 167*
multiple printer drivers, *Dec 209*
NEC SilentWriter LC890, *Dec 77*
OmniLaser, *Feb 99*
OmniLaser 2108, ***Sep 157 r***
PaperJet 400/XP Document Feeder, *Jul 172*
parallel printer cable, *Nov 11*
Personal LaserPrinter, ***Sep 108 r***
PostScript, *Feb 14,* ***Jun 122 r,*** *Nov 29*
Printer Muffler, *Aug 179*
printing envelopes, *Mar 159*
PrintMaster, *Oct 112*
Printware 720 IQ, *Nov 101, Dec 79*
Printworks for Mac, *Feb 97, Jul 167,* ***Sep 154 r***
PSPrint, *Aug 108,* ***Sep 164 r***
QMS PS-800/PS-800+ , ***Jun 122 r,*** *Dec 77*
QMS PS-800 II, *Oct 176*
QuickDraw, ***Sep 108,*** *Nov 43*
Qume ScripTEN, *Feb 14, Dec 77*
Seiko D-Scan, *Sep 146*
Shinko thermal printer, *Nov 99*
SoftStyle printer drivers, *Feb 97*
tiling, *Aug 193*
TI OmniLaser 2108, *Dec 77*
tips, ***Jun 221***
TOPSPrint, ***Sep 164 r***
TurboLaser/PS, *Nov 270*
1200-dpi, *Dec 69*
Varityper VT600, *Aug 11, Dec 69*
WinPrint, *Aug 108*

PrintMaster, *Oct 112*
Printware 720 IQ laser printer, *Nov 101, Dec 69*
Printworks for the Mac, *Feb 97, Jul 167,* ***Sep 154 r***
ProAnalysis, *Aug 93*
ProApp series hard disks, *Jan 102, Dec 108*
ProApp 10, 20, 40S, *Jan 102*
Prodigy 4 board, *Mar 97*
Prodigy SE accelerator card, *Jul 174*
Professional Bibliographic System, ***Jan 129 r***
Professional Composer, *Jun 35, Aug 138, Nov 276*
Professional Layout Templates Collection, *Nov 268*
Professor Craps, *Nov 268*
Profit Stalker II, *Jan 203, Apr 111*
ProGlyph, *Jun 99*
Programmer's On-Line Companion, *Jun 105*
Programmers at Work, *Jan 75*
Programming, ***Oct 142.*** *See also* HyperCard; Microsoft BASIC
Advanced AI Systems Prolog, *Oct 142*
APL Plus System for the Macintosh, ***Aug 153 r,*** *Oct 142*
Aztec C, ***Apr 167 r,*** *Oct 142*
BASIC compilers, ***May 143 r***
Basic Power System, *Oct 142*
beginner's guide to developing application, ***Jun 135***
C, *Feb 101, Oct 142*
CAPPS, *Dec 159*
Chalcedony Prolog, ***Oct 142***
choosing a language, *Oct 142*
Consulair 68000 assembler, *Oct 142*
Consulair Mac C, ***Jul 155 r,*** *Oct 142*
Coral Lisp, *Jan 13*
Debugger, *Mar 13*
enlarging system heap, *Feb 163*
ExperCommonLISP, *Jan 13*
ExperInterface Builder, *Jun 171*
ExperLisp, *Oct 142*
ExperLogo, *Oct 142*
FORTRAN77, *Oct 142*
Hookup, *Jan 79*
HUMBLE, *Apr 119*
Hyper-C, *Oct 142*
Inside Macintosh, *Jul 97*
Inspector, *Aug 174*
Lightspeed Pascal, ***Feb 125 r,*** *Oct 142*
Mac C Jr., *Mar 14, Oct 142*
MacAdvantage, *Oct 142*
MacAPL, *Sep 175, Oct 142*
MacC and Toolkit, *Oct 142*
MacC Jr., *Oct 142*
MacCOBOL, *Sep 40*
MacFORTH Plus, *Oct 142*
Mach2, *Jun 172,* ***Sep 161 r,*** *Oct 142, 237*
Macintosh Pascal, *Oct 142*
Macintosh Software Entrepreneurs Forum, *Feb 101*
MacMETH, *Oct 142*
MacModula-2, *Oct 142*
MacScheme, *Oct 142*
MactoGS Assembler Linker, *Jan 13*
MacTran77, *Oct 142*
Mac Tutor, *Sep 40*
Mac II Tools for MacForth, *Dec 159*
MasterFORTH, *Oct 142*
McAssembly, *Oct 142*
Microsoft FORTRAN bugs, *Feb 46, Oct 142*
MPW Assembler, *Oct 142*
MPW C, *Oct 142*
MPW compilers, *Sep 95*
MPW Pascal, *Oct 142*
Neon, *Oct 142*
NSChart and NSPDL Language Translators, *Sep 175*
Object Logo, ***Jun 162 r,*** *Sep 248, Oct 142*
PCMacBASIC, ***May 143 r,*** *Oct 142*
Power Tools, *Nov 268*
Programming with the Programmer's Workshop, *Sep 95*
Prototyper, *Apr 119*
SemperSoft Modula-2, *Sep 95, Oct 142*
Smalltalk, *Oct 142*
Smalltalk-80, *Apr 119*
TDI Modula-2, *Oct 142,* ***Nov 155 r***
Terrapin Logo, *Aug 174, Oct 142*
TML Modula-2. *Sep 95, Oct 142*
TML Pascal, ***Feb 125 r,*** *Oct 142*
TML Modula-2 for MPW, ***Dec 152 r***
True BASIC, ***Oct 142***
Turbo Pascal, ***Apr 162 r,*** *Oct 142,* ***213***
UCSD Modula-2, *Oct 142*
UCSD Pascal, *Oct 142*
VIP, *Feb 105,* ***May 157 r,*** *Oct 142*
ZBASIC, ***May 143 r,*** *Aug 37, Oct 142*
Programming with the Programmer's Workshop, *Sep 95*
Project Billing, ***Aug 154 r***
Project management, Micro Planner Project Exchange, *Jul 167*
Project Victoria, *Apr 113*
Project Xanadu, *Jun 38*
Prose, *Aug 95*
Prospect Plus, *Dec 159*
Prosper, *Nov 268*
Pro3D, ***May 108 r,*** *Aug 97*
color version, *Jul 14*
Prototyper, *Apr 119*
PS-800/PS-800 Plus printers, ***Jun 122 r***
PS Jet printer, ***Jun 122 r***
PSPrint, *Aug 108,* ***Sep 164 r***
Public domain/shareware
Air Traffic Controller, *Nov 164*
Amortization Calculator, *Aug 101*
Amps, *Sep 93*
Aquarium, ***Apr 156***
BackDown DA, *Oct 91*
Beep Init, ***Apr 156***
Big Ben clock DA, *Oct 187*
BigCursor FKey, *Jul 203*
Billiard Parlour, *Nov 164*
BMX–The Racing Game, *Sep 93*
Bouncy, ***Apr 156***

Bricks DA, *Oct 187*
Bug, ***Apr 156***
Camera, *Oct 187*
Canfield, *Sep 93*
Cap'n Magneto, *Nov 164*
CE Software, *Dec 75*
Change Appl Font, *Nov 99*
Change Font DA, *Aug 120*
ClipperKey, *Nov 99*
Clock, ***Apr 156***
commentary, *Apr 61*
Convert, *Aug 101*
Copier, *Feb 169*
Copy Screen FKey, *Jul 203*
Corporate Image Templates, *Jul 167*
Crabs, ***Apr 156***
CryptoSolve, *Sep 93*
CrystalRaidr, *Sep 93*
DA Key, *Jul 203*
Date Key, *Jul 203*
Deep Angst, *Nov 164*
DeskZap, *Jan 195, Aug 101*
Disk Librarian, *May 27*
Disk-File Utility, *Jul 203*
DiskInfo, *Oct 187*
Display Message DA, *Aug 120*
Double Apple, *Jul 177, Aug 120*
Duck Hunt, *Sep 93*
Dungeon of Doom, *Nov 164*
Dvorak FKey, *Jul 203*
Educomp, *Aug 28, 239*
Envelope, *May 14*
Fade to Black, *Oct 187*
FileStar, *Jul 167, Aug 101*
FKey Maker, *Jul 203*
FKey Manager, *May 105,* ***Jul 203***
Flush FKey, *Jul 203*
Fontsie FKey, *Jul 203*
Fractal Contours, *Mar 91*
GetInfo FKey, *Jul 203*
Golf, *Sep 93*
Gone Fishin', ***Apr 156,*** *177*
Grep-Wc DA, ***Sep 163 r***
Gunshy, *Sep 93*
Hearts, *Sep 93*
HelpDA, *Aug 101*
HelpFileMaker, *Aug 101*
HFS Find, *Aug 101*
Iconstructor, *Oct 97*
identifying, *Jul 31, Dec 34*
Iggy Iggopolis, *Sep 93*
Immortality, *Oct 91*
Init files, *May 105, Oct 187*
Init FKey, *Jul 203*
JClock, *May 105, Aug 120, Sep 194, Oct 187, Nov 99*
Julia, *Mar 91*
KeyString, *Jul 203*
Klondike, *Sep 93*
Knockout DA, *Aug 120, Oct 187*
LaserFeeder, *Jan 185*
LaserKey, *Jul 203*
LaserKey Installer, *Feb 163*
LaserWriter fonts, *Oct 87*
Layout, *Oct 97*
Mac Fractal, *Mar 91*
MacWait, ***Apr 156***
Mandelbrot, *Mar 91*
Mandelzoom, *Mar 91*
Memory, *Sep 93*
Mickey Mouse clock DA, *Oct 187*
Mighty Finder, *Jan 195*
miniWriter DA, ***Sep 163 r***
MockChart, *Aug 120*
MockPackage, *Oct 187*
MockWrite, *Sep 245, Oct 187*
Moving Lines FKey, *Jul 203*
Navigator, *Dec 67*
Oasis, *May 28, Jul 31*
1000 Miles, *Sep 93*
Other, *Jan 195, Jul 31, 177, Nov 99*
Packit III, *Sep 245*
Password, *May 105, Jul 203*
Pathname FKey, *Jul 203*
PD FontEdit, *Oct 97*
Periodic Table, *Aug 101*
Phrase Craze Plus, *Sep 93*
PowerStation, *Sep 99*
practical jokes with, ***Apr 156***
Public Domain Exchange, *Aug 28, 239*
QDial DA, *Sep 245*
Red Ryder Host, *Oct 180*
Run'r, *Jan 195*
SafeLaunch FKey, *Jul 203*
Saviour DA, *Aug 120*
Scarab of Ra, *Nov 164*
Scholar's Aid, *Jul 168*
ScreenLocker DA, *Aug 120*
Screen Maker, ***Apr 156,*** *Jun 187*
Screen Saver FKey, *Jul 203*
ScreenToPaint FKey, *Jul 203*
Set Clock, *Oct 97*
Set Sound FKey, *Jul 203*
SkipFinder, *Jan 195*
Smart Quotes DA, ***Sep 163 r***
SMUG Fonts Part 1, *Jun 178*
Sound Init, ***Apr 156***
Space Warp FKey, *Jul 203*
Suitcase, *Aug 11, Sep 97, 99,* ***Dec 150 r***
SuperHelp, *Aug 101*
TalkingKeys, ***Apr 156***
Talking Moose, ***Apr 156***
Time Logger, *Nov 99*
Timeout, *Nov 164*
Timer Key, *Jul 203*
Tiny Finder, *Jan 195*
Toggle Key, *Jul 203, Nov 99*
Typewriter, ***Apr 156***
Version Reader FKey, *Jul 203*
Waystation, *Jan 35, 195*
Window FKey, *Jul 203*
zFinder, *Jan 195*
PUP (Paragon Update Procedure), *Jul 168*

Q

Q & D Filer, *Jan 195*
QDial DA, *Sep 245*
QMS PS 800 printers, ***Jun 122 r;*** *Oct 176, Dec 77*
Q Parser Plus, *Jul 168*
quadLynx trackball, ***Jun 161 r***
Qualstar Ministreamer tape drive, *Sep 178*
Quark XPress, *Jan 14, Feb 103,* ***Aug 148 r;*** *Sep 124*
color separations, *Nov 126*
spelling checker, ***Oct 114 r***
tips, ***Nov 301***
update, *Dec 243*
QUED, *Aug 185*
QUED/M, *Dec 159*
Quick & Dirty Utilities, Volume 2, *Jul 203, Oct 237*
Quick Ceph, *Aug 170*
QuickDex, *Aug 170*
QuickDraw
-based laser printer, *Sep 108*
color, *Apr 144*
as page-description language, *Dec 11*
vs. PostScript, *Aug 41, Sep 45, 108, Dec 11*
QuicKeys, *Dec 75*
Qume ScripTEN printer, *Dec 77*

R

Rabbit Industries Magic series hard disks, *Jan 102*
Racal 9600VP modem, ***Jul 138 r***
Racet Computers Administrator I, II hard disks, *Dec 108*
Radius accelerator cards, *Jul 174, Sep 132,* ***Nov 151 r***
Radius Full Page Display, ***Jan 88 r;*** *Apr 150*
Rags to Riches, *May 216,* ***Jun 156 r;*** *Oct 136*
Ragtime, ***Jan 112, Feb 146 r;*** *Aug 226, Sep 124*
Rainy Day Games, *Sep 176*
RAM cache, defined, *Jan 175*
RAM disk, defined, *Jan 175*
RamStart update, *Feb 198*
Raskin, Jef, *Feb 61*
Raster display, *Aug 194*
Read-It, *Nov 268*
ReadySetGo, ***Jan 112,*** *Sep 124*
spelling checker, ***Oct 114 r***
text-wrap tip, *Dec 216*
tips, ***Jun 209***
update, *Oct 89*
version 3.0 tips, ***Jun 209***
RealClean, *Oct 176*

(continues)

Real estate programs, *Aug 93, Oct 174*
Real Estate Investment Analysis update, *Sep 248*
Real Estate Partners, *Jul 168*
Realist. *See* ImageStudio
Recovered files, opening, *May 173*
Red Ryder
origin of name, *Feb 14, Jun 35*
terminal emulation, *May 134*
tips, ***Apr 199***
version 10.0, *Jul 31*
Red Ryder Host, *Oct 180*
Reflection for the Macintosh, *Jun 178*
Reggic, *Nov 268*
Relax Technologies hard disks
HardPlus series, *Dec 108*
Hard 20 Plus, *Jan 102, Dec 108*
MacMate series, *Dec 108*
MacMate 20, *Jan 102, Dec 108*
MiniMate 20, 30, *Dec 108*
Relax SI series, *Dec 108*
Relax Technologies Tape 60 Plus, *Aug 128 r*
Rely Drive series hard disks, *Sep 182, Dec 108*
ResEdit
determining version number with, *Jan 165*
installing additional DAs with, *Feb 164*
installing extra DAs, *Jul 177*
kerning characters, *Jan 185*
shortening menu titles, *Mar 169*
Resume button, activating after System error, *Apr 183*
Returns, inserting or stripping, *Nov 99*
RIP, defined, *Jan 175*
RMS Plus, *Nov 268*
Roadwar 2000, *Jun 178*
Rodime hard disks
45 Plus, ***Nov 148 r***
1400RX, *Dec 108*
HDI (II), *Dec 108*
Plus series, *Dec 108*
RX series, *Oct 176, Dec 108*
ROM
defined, *Jan 175*
determining type, *Apr 178*
old vs. new, *Jan 175*
256K, *Apr 144*
R-Server communications server, *Oct 176*
RS-422A, defined, *Jan 175*
Run'r, *Jan 195*

S

Sad Mac codes, Mac Plus, *Feb 163*
SafeLaunch FKey, *Jul 203, Oct 187*
Salary Magic, *Jun 178*
Sampled sounds. *See also* Music
Dyaxis A-to-D conversion system, *Aug 12*
Sound Lab, *Jul 156 r*
SANE, *Apr 126*
Saviour DA, *Aug 120*
Scanners. *See* Digitizers
Scarab of Ra, *Nov 164*
Schedule Maker, *Oct 173*
Schema, *Jul 132*
Scholar's Aid, *Jul 168*
Scientific Desk, *Aug 170*
SciFonts, *Dec 159*
Scoop, *Jul 14, Aug 174, Sep 124*
Scrabble, *Apr 14, Dec 159*
ScreenLocker DA, *Aug 120*
ScreenMaker, *Apr 156,* *Jun 187*
Screen Saver FKey, *Jul 203*
Screen savers, *Apr 177, May 105*
Screens. *See* Monitors
ScreenToPaint FKey, *Jul 203*
Scribbler DA, *Oct 187*
ScriptWriter, *Apr 13,* ***Nov 156 r***
Script-writing programs, *Apr 13, Nov 156*
SCSI
connecting multiple devices to Mac, *Feb 163*
defined, *Jan 175*
hard disks, *Jan 102, Apr 14, Dec 108*
Mac II implementation, *Apr 126*
port adapters, ***Feb 154 r***
port upgrade, *Aug 53*
tape drives, *Jan 102*
unplugging devices before changing connections, *Aug 181*
Sculley, John, *Jan 17, Nov 73*
SD series hard disks, *Jan 102*
SE. *See* Macintosh SE
Sea Life clip art, *Oct 173*
Security systems, *Nov 97*
Seiko D-Scan color printer, *Sep 146*
SemperSoft Modula-2, *Sep 95, Oct 142*
Sentinel, *Aug 174, Nov 11*
Servant documentation, *Nov 12*
Set Clock, *Oct 97*
SetFile Key, *Jul 203*
Set Paths, *Jul 93*
Set Sound FKey, *Jul 203*
ShadowGate, *Sep 168 r*
Shanghai, *Jan 136 r*
Shareware. *See* Public domain/shareware
Shipping cases, *Jun 182*
Shiva NetModem V1200, *Oct 174*
SideKick, *Aug 120, Oct 187*
version 2.0, ***Oct 156 r***
Sierra 20/40, 30/40, *Jan 102*
Sigma Designs LaserView Display System, *Oct 174*
SIMMs, *Jan 55, 175*
Simonyi, Charles, *Feb 61*
SimpleSpan, *Jun 178*
Site licensing, *Jan 13*
68020 chip, *May 112, Sep 65*
Sizer and Adjacency, *Mar 150 r,* *Jul 132*
SkipFinder, *Jan 195*
Slide production, ImageMaker, *May 13, Jun 107, Sep 182*
SlimLine SCSI drives, *Jan 102*
Smalltalk, *Oct 142*
Smalltalk-80, *Apr 119*
Smart Alarms DA, *Apr 222, Aug 120, Oct 187*
Smartcom II, *May 134*
Smart Quotes DA, *Sep 163 r*
SmartScrap & The Clipper, *Mar 91,* ***Jul 148 r,*** *Aug 120, Oct 187*
SmartStat, *Aug 12*
Smart Words, *Jun 178,* ***Dec 141 r***
Smash Hit Racquetball, *Jan 81*
Smith, Burrell, *Jan 17*
SMUG Fonts Part 1, *Jun 178*
Soft Ad, *Nov 11*
SoftPC, *Oct 12*
Softstrip reader, applications for, *Feb 38*
SoftStyle, purchased by Phoenix Technologies, *Dec 151*
SoftSynth, *Jun 111, Aug 138,* ***Oct 163 r***
Software development, beginner's guide, ***Jun 135***
Softworks SD series hard disks, *Jan 102*
Solo, *Jan 112,* *Feb 13, 14*
Sony CPD-1302 color monitor, *Dec 90*
Sound, digitizing, *Mar 167*
SoundCap, *Apr 156, May 105*
name changed to SoundWave, *Oct 237*
Sound design, *Aug 138*
Sound Designer, *Aug 138,* ***Oct 162 r***
Sound Init, *Apr 156,* *May 105, Oct 187*
Sound Lab, *Jul 156 r,* *Nov 36*
SoundWave, *Oct 237*
Space Edit, *May 108 r, Jul 160 r*
Space Quest, *Oct 165 r*
Space Warp FKey, *Jul 203*
Spectra Micro Development Hard Disk 20, *Jan 102*
Spectra Micro Development Spectra Drive series, *Jan 102, Dec 108*
Spectrum, *May 103*
SpellCheck, *Mar 145 r*
Spelling Champion, *Jul 162 r; Oct 114 r*
Spelling checkers
Graham Speller, *Dec 159*
MacLightning, *Aug 120, Sep 248,* ***Oct 114 r,*** *187*
MacProof, ***Mar 151 r***
Medical Dictionary for Spellswell, *Aug 170*
Microsoft Word, ***Oct 114 r***
overview, ***Oct 114***
Quark XPress, ***Oct 114 r***
ReadySetGo, ***Oct 114 r***
SpellCheck, ***Mar 145 r***
Spelling Champion, ***Jul 162 r; Oct 114 r***
Spellswell, *May 216,* ***Aug 150 r; Oct 114 r;*** *Nov 321,* ***Dec 146 r***
Thunder, ***Jun 160 r;*** *Sep 248,* ***Oct 114 r;*** *187*
WorksPlus Spell, *Mar 97,* ***Oct 114 r; Nov 156 r***
WriteNow, ***Oct 114 r;*** *Nov 273*

Spellswell, *May 216,* ***Aug 150 r; Oct 114 r;*** *Nov 321,* ***Dec 146 r***
Spoolers
K-Spool, *Oct 173*
LaserWriter, ***Jun 142 r***
overview, ***Mar 173***
Plus-Spooler, *Dec 159*
Printworks for the Mac, ***Sep 154 r***
SuperLaserSpool, *Mar 13*
Spreadsheets, Trapeze, ***May 152 r***
SPUD. *See* Scoop
Startup Desk, *Oct 187*
Startup screen, creating, *Jun 187*
Stat80, update, *Jan 212*
Stationfall, *Sep 176*
Statistics
Data Desk, ***Aug 157 r***
MacSS, *Sep 175*
SmartStat, *Aug 12*
Stat80, *Apr 42*
Systat, *Apr 42,* ***Sep 153 r***
STELLA, *Jan 40*
Stepping Out, *Apr 14,* ***Oct 161 r;*** *237*
S/3X Link, *May 134*
Stock market programs, ***Jan 203,*** *Apr 111*
Market Pro, ***Jan 124 r***
Spectrum, *May 103*
Storyboarder, *Apr 13*
Strategic Conquest II, ***Jan 129 r***
Stretch Screen Display, *May 43*
Strictly Business Accounts Payable, *Jun 178*
Studio Session, *Feb 101,* ***Nov 158 r***
StuffClip, *May 176*
S-20+, *Jan 102*
Style checkers, *Mar 151, Aug 95, Sep 162*
Doug Clapp's Word Tools, ***Sep 162 r;*** *Dec 30*
MacProof, ***Mar 151 r***
Style sheets, *Mar 120*
Sub Battle Simulator, ***Jul 161 r***
Suitcase, *Aug 11, Sep 97, 99,* ***Dec 150 r***
Sunol Systems Sunstreak SCSI series, *Jan 102, Dec 108*
Sunol Systems SunStreak SCSI-245, ***Jul 126 r;*** *Dec 108*
Supercomputers, *Apr 115*
SuperHelp DA, *Aug 101*
SuperLaserSpool, *Mar 13,* ***Jun 142 r***
SuperMac Technology hard disks
DataFrame 40-XP, ***Apr 164 r***
DataFrame series, *Jan 102, Dec 108*
SuperMac Technology DataStream tape drive, ***Aug 128 r***
SuperMac Technology 19-inch Color Monitor, ***Jul 108***
SuperMac Technology 19-inch Monochrome Monitor, ***Jul 108***
Super MandelZoom, *Aug 28*
SuperPaint, ***Jan 96 r***
help screens DA, *Aug 101*
startup screen, *Jun 187*
tips, *Jul 179,* ***Dec 219***
touching up scanned images with, *Mar 14*
transparent LaserBits, *Jul 179*
SuperStation, *May 27*
Super 3D, *Aug 97*
SupraDrive series hard disks, *Jan 102*
Surgeon, ***Mar 154 r***
Surge suppressors, *Jul 185*
Systat, *Apr 42,* ***Sep 153 r***
System file
backing up, *Feb 169*
determining version number of, *Jan 165*
Mac II and SE, *Apr 144*
System Folder, problems copying to floppy, *Sep 11*
Systems analysis, *Jan 118*
System Saver fan, *Jul 185*

T

Tabby, *Dec 12*
Tablets, graphics
PenMac, *Sep 178*
prevent scratching, *Sep 196*
TalkingKeys, ***Apr 156***
Talking Moose, ***Apr 156***
TangentShare, *Aug 108*
Tape drives, *Feb 169,* ***Aug 128***
ADON TD-40, ***Aug 128 r***
Apple Tape Backup 40SC, ***Aug 128 r***
backup software, ***Aug 134***
buyer's guide, ***Nov 224***
General Computer HyperTape, ***Aug 128 r***
Kamerman Labs Cirrus 40T, *Aug 128*
Kamerman Labs 40T, *Jan 102*
LoDown T-20, *Jan 102,* ***Feb 151 r***
MDIdeas TDBK-20+, *Jan 102,* ***Feb 151 r***
Micah TB 40/60, *Jan 102*
Mirror Magnum Tape 40, *Jun 180,* ***Aug 128 r***
Mirror Magnum Tape 20, *Jan 102*
Novastor Novatape 110, *Oct 176*
NuData Data File, ***Aug 128 r***
NuData Giga Cell, *Oct 174*
overview, ***Aug 128***
Peak Systems Plus-20T, *Jan 102*
Peak Systems Plus 60-Tape, ***Aug 128 r***
Peripheral Land MacBack Plus 40, ***Aug 128 r***
Peripheral Land MacBack +20, +60, *Jan 102*
Qualstar Ministreamer, *Sep 178*
Relax Tape 60 Plus, ***Aug 128 r***
SCSI, *Jan 102*
SuperMac DataStream, ***Aug 128 r***
Tecmar QT-Mac40, *Oct 176, Nov 11, 95*
Warp Nine Transporter 20, *Jan 102*
Wollongong macTape, *Oct 174*
Tass Times in Tonetown, ***Jun 165 r;*** *Dec 118*
Taxan Multivision 770 Plus color monitor, *Dec 90*
Tax preparation programs, *Feb 189*
MacInTax, ***Mar 141 r***
MacInTax Planner, *Aug 167*
TaxCalc Tax Planner, *Feb 189*
TaxEase, *Feb 189*
TDBK-20+ tape backup, *Jan 102,* ***Feb 151 r***
TDI Modula-2, *Oct 142,* ***Nov 155 r***
Technology and Issues conference, ***Sep 45***
TechScriber, *Jan 14, Feb 103*
Tecmar QT-Mac40 tape drive, *Oct 176, Nov 11, 95*
Tekalike, *May 134*
name changed to TextTerm+Graphics, *Oct 237*
Telcor Accelerator modem, ***Jul 138 r***
Telebit Trailblazer modem, ***Jul 138 r***
Telecommunications. *See* Communications
Telescape Pro, *May 134*
Telex, Mac as, *Oct 180*
Tempo, *Jun 14, Oct 187*
Tempo/RT, *Mar 14*
Terminal emulation, *Apr 187,* ***May 134,*** *Oct 130*
Mac240, *May 134, Oct 130*
pcLink, ***Nov 161 r***
Reflection for the Macintosh, *Jun 178*
S/3X Link, *May 134*
3278, *Jul 170*
VersaTerm/Pro, *Oct 130*
TermWorks, ***Apr 173 r***
Terrapin Logo, *Aug 174, Oct 142*
Tesler, Larry, interview, *Jun 75*
Test creation, ***Jan 134***
Testament, *Oct 174*
TextEffects, *Mar 95*
TextTerm+Graphics, *Oct 237*
Textures, ***Jan 128 r;*** *Sep 124*
Thesaurus, *Jul 167*
ThinkTank, *Dec 124*
Third Apple, *Jun 107*
Thomson 4375M color monitor, *Dec 90*
3Com, merger, ***Dec 151 r***
Mac3D, *Jan 212,* ***May 108 r;*** *Jul 14, Aug 97*
Pro3D, ***May 108 r;*** *Jul 14, Aug 97*
Space Edit, ***May 108 r; Jul 160 r***
Super 3D, *Aug 97*
3-D Digitiser, *Feb 95*
3-D graphics programs, ***May 118 r***
3Server3, *Jan 102,* ***132 r***
Thunder, ***Jun 160 r;*** *Sep 248,* ***Oct 114 r***
Thunder Mountain series, *Mar 99*
ThunderScan, ***Mar 133 r;*** *May 14,* ***Jul 116 r;*** *Sep 248*
TIFF, *Jul 119*
TimeLink, ***Mar 153 r***
Time Logger, *Nov 99,* ***165 r***
TimeMinder update, *Nov 321*
Timeout, *Nov 164*
Timer Key, *Jul 203*
Time Scrolls, *Sep 176*
Timeslips III, *Dec 159*
Tiny Finder, *Jan 195*
TI OmniLaser 2108 printer, *Dec 77*
Tips. *See* product name or subject area
TML Modula-2, *Sep 95, Oct 142*

(continues)

TML Pascal, ***Feb 125 r,*** *Oct 142*
for MPW, ***Dec 152 r***
Toggle Key, *Jul 203, Nov 99*
Tools for Writers, *Aug 95,* ***Sep 162 r***
TOPS, *Mar 114, Aug 108, Nov 321*
TOPSPrint, ***Sep 164 r***
TOPS Repeater, *Jun 180*
TOPS Star, *Jun 180*
TOPS Terminal, *Dec 159*
Totem Bernoulli Drive Series, *Jun 180*
Track, *Oct 174*
Trackballs, ***Jun 161 r***
TrafficReporter, *Mar 13*
Traid Names, *Nov 268*
Transporter 20, *Jan 102*
Transylvania hints, *Jan 168*
Trapeze, ***May 152 r,*** *Aug 226, Oct 237*
Traveling with Mac, tips for, *Mar 159, Aug 181*
Triad Artists, use of Mac by, *Jul 93*
TribNet, *Apr 109*
Trimar Generic Drive 20, *Jan 102*
Troubleshooting tips, ***Apr 215***
True BASIC, *Oct 142*
TrueForm System scanner, *Sep 182*
TurboLaser/PS printer, *Nov 270, Dec 77*
Turbo Maccountant, update, *Apr 222*
Turbo Mouse, ***Jun 161 r***
Turbo Pascal, ***Apr 162 r,*** *Oct 142*
tips, *Oct 213*
Typesetting, *Nov 101*
Command Typographer, *Nov 267*
Lithographer, *Nov 97*
PostCode and Micro-Set, *Jun 172*
services, *Jun 221*
Tegra, *Nov 101*
Textures, ***Jan 128 r***
Varityper VT600, *Nov 101*
Typewriter, ***Apr 156***
Typing Intrigue, ***Mar 148 r***
Typing Made Easy, ***Mar 148 r***
Typing tutors, ***Mar 148 r***

U

UCSD Modula-2, *Oct 142*
UCSD Pascal, *Oct 142*
Ultra-Office, *Jun 101*
Univation AS series hard disks, *Jan 102*
University Consortium
University of Michigan, *Feb 99*
University of Utah, *May 97*
UNIX, *Apr 131, Jun 75*
A/UX, *Apr 131, Oct 95, Nov 136*
communication with workstations, *May 113*
MacNIX, *Feb 102*
TOPS, *Aug 108*
Ultra-Office, *Jun 101*
UpBeat, *Oct 174*
Upgrades, *Jan 14,* ***175,*** *Apr 150,* ***Aug 53,*** *Oct 95,* ***Dec 235***
Ask Dr. Upgrade, ***Aug 53***
AST-Pak, *Jul 170*
AST-RM4, *Jul 168*
buyer's guide, ***Nov 234***
commentary, *Jan 55*
Dove, *Oct 11*
Dove Plus 4H, *Apr 14*
Dove Power Miser, *Sep 12*
General Computer HyperCharger 020, ***Sep 132 r***
impact of chip prices on, *Jan 79*
Levco Prodigy SE, ***Sep 132 r***
logic board, *Aug 53*
MacMemory, *Mar 14*
MacMemory multifunction board, *Jan 14*
MaxPlus, ***Mar 144 r***
MaxPlus 4-Pak, *Apr 14*
National Semiconductor, *May 13*
National Semiconductor NS8/16, *Oct 176*
Novy, *Jan 14*
One + One, ***Mar 144 r***
128K to Plus, *Oct 181*
Peak Systems Orion, ***Sep 132***
Performance Electronics, *Jul 172*
ROM, *Aug 53*
Ryad, *Jan 14*
Spectra, *Jan 14*
using old programs with, *Feb 35*
UpTime, *May 99*
User groups, *Mar 63*
BMUG, *Aug 239*
Boston Computer Society, *Aug 239, Nov 99*
European, *Sep 101*
PageMaker discount, *Nov 12*
referral number, *Jul 13*
Utilities. *See also* Backup programs
AutoMac II, ***Nov 159 r***
AutoSave, *Oct 173*
Camera, *Jun 187, Oct 187*
Copy II Mac update, *Sep 247*
CrashFix, *Apr 183*
DA Installer+, *Jun 187*
DA Switcher, *Nov 267*
Desk Necessities, ***Jun 167 r***
DeskZap, *Jan 195, Aug 101*
DHFS Find, *Aug 101*
Disk-File Utility, *Jul 203*
Disk First Aid, *Jan 13*
DiskFit, *Nov 11*
DiskTools, ***Dec 144 r***
DiskTop, *Jul 167, Aug 120,* ***146 r***
DXF Transfer, *Oct 173*
Fade to Black, *Oct 187*
FileStar, *Jul 167, Aug 101*
Find File, *Jan 13*
Findswell, *Jun 171,* ***Dec 146 r***
1st Aid Kit, *Apr 220, Jul 153*
FKey Manager, ***Jul 203***
Grep-Wc, ***Sep 163 r***
Hard Disk Partition, *Jul 126,* ***Aug 158 r***
Icon-It, *Nov 267*
Iconstructor, *Oct 97*
LaserFeeder, *Jan 185*
MacLink, ***Apr 163 r***
MacSafe, ***Jun 166 r***
MacTree, *Mar 97*
miniWriter, ***Sep 163 r***
Packit III, *Sep 245*
PD FontEdit, *Oct 97*
QDial, *Sep 245*
SafeLaunch, *Oct 187*
Saviour, *Aug 120*
Sentinel, *Nov 11*
Set Clock, *Oct 97*
SLayout, *Oct 97*
Smart Quotes, ***Sep 163 r***
Suitcase, *Aug 11, Sep 97, 99,* ***Dec 150 r***
ToggleKeys, *Nov 99*

V

Value/Screen Plus, *Apr 111*
Varityper VT-600 printer, *Aug 11, Nov 101, Dec 69*
Ventuno 3 Autoloader disk duplicator, *Oct 176*
Verbum magazine, *Jul 97*
VersaCAD, *Sep 12, Oct 99, Nov 116, Dec 96*
VersaTerm, *May 134*
VersaTerm/Pro, *May 134, Oct 130*
Version numbers, determining, *Jan 165, Jul 203*
Version Reader FKey, *Jul 203*
Video Buffer card, National Semiconductor, *May 13*
Video cards, *Jul 108, Dec 90*
Apple Mac II, *Apr 150, Jul 108, Dec 90*
installing multiple, *Dec 90*
Jasmine, *Jul 108*
National Semiconductor, *Jul 108*
PCPC II, *Dec 90*
Sigma Designs LaserView, *Jul 108, Oct 174*
SuperMac Graphix, *Jul 108*
SuperMac Spectrum, *Jul 108, Dec 90*
Video digitizers. *See* Digitizers
Videodisks, HyperCard drivers, *Dec 79*
VideoWorks, *Mar 13*
HyperCard link, *Nov 103*
VideoWorks II, ***Oct 159 r***
VIP, *Feb 105, May 157, Sep 40, Oct 142*
Visions Plus, *May 134*
Voila, ***May 164 r;*** *Oct 187,* ***Dec 124***

W

WalkMac, *Nov 105*
Warnock, John, *Jan 17, Sep 79*

Warp Nine Photon series hard disks, *Jan 102, Dec 108*
Warp Nine P20i, 30i, 45i hard disks, *Dec 108*
Warp Nine Transporter 20 tape drive, *Jan 102*
Warp 20, *Jan 102*
Waystation, *Jan 195*
multiple copies of, *Jan 35*
Western Computer Big Mack Twin Pack hard disks, *Jan 102*
Whizzard accelerator card, *Jun 180*
Whodunit, *Jul 168*
Widgets, *Oct 182*
Window FKey, *Jul 203*
Windowing systems, ***Nov 136***
Windows DA, *Jul 93, Aug 41*
Winer, David, interview, *Jul 73*
WinPrint, *Aug 108*
Wollongong macTape, *Oct 174*
Word Finder, *Nov 105, 268*
Word Handler update, *Jan 212*
Word processors. *See also* MacWrite; Microsoft Word; Spelling checkers
adjusting space between words, *Aug 188*
Arabic, *May 126, Jun 109*
Chinese, *Jan 83, May 126*
choosing, *Dec 53*
CineWrite, *Aug 167*
curly quotes, *Sep 163*
FullWrite Professional, *Feb 13, Sep 95*
future of, *Feb 61*
Hebrew, *May 126, Sep 31*
hyphenation DA, ***Jan 135 r***
line breaks in text files, *Aug 185*
MacEqn equation DA, ***Jan 133 r***
MacSpec, ***Aug 156 r***
margins, *Aug 181*
Merriam Webster Thesaurus for Microsoft Word 3.0, *Jul 167*
MindWrite, ***Apr 160 r;*** *Dec 243*
miniWriter DA, ***Sep 163 r,*** *Oct 187*
MockWrite, *Feb 167, Sep 245, Oct 187*
Scriptwriter, ***Nov 156 r***
Smart Quotes DA, ***Sep 163 r***
typing right-to-left, *May 171*
underlining blank spaces, *Mar 164*
Word Finder, *Nov 105*
WordPerfect, *Oct 11*
WriteNow, ***Jan 122 r***
Word Tools. *See* Doug Clapp's Word Tools
Word. *See* Microsoft Word
WordPerfect, *Oct 11*
Works. *See* Microsoft Works
WorksPlus Spell, ***Oct 114 r, Nov 156 r***
Workstations, Mac II compared to other, ***Nov 136***
World Builder, *Nov 164, 321*
World Class Macintosh contest winners, *Sep 114*
World Cup Soccer, *Sep 176*
WORM drives, *May 43, 47*
WOS/CTB/McGraw-Hill Fund Accounting, *Aug 174*
WOS Fund Accounting Software, *Oct 136*
WriteNow, ***Jan 122 r***
spelling checker, ***Oct 114 r,*** *Nov 273*

X

X Window System, *Nov 136*
X-Press Information Services, *Feb 99*
X-10 Powerhouse update, *Feb 198*
XDOS, *Feb 105*
Xerox PARC, *Jun 57, 75, Sep 79*
XPress. *See* Quark XPress

Y

Yocam, Del, interview, *Apr 85*

Z

ZBASIC, ***May 143 r,*** *Aug 37, Oct 142*
zFinder, *Jan 195*
Zhongwen Talk, *Sep 12*

MacProducts USA
1-800-MAC-DISK

SOFTWARE

Adobe Illustrator	369.00
Ancient Art of War	29.00
Cricket Draw	179.00
Cricket Graph	134.00
Crossword Magic	34.00
Dark Castle	33.00
Dbase Mac	320.00
Disk Fit	54.00
Falcon	37.00
FullWrite	204.00
LaserFX	139.00
Lightspeed C	125.00
MacGolf	36.00
MacMoney	39.00
MacProof	129.00
McMAX	192.00
Microsoft Excel	229.00
Microsoft Word	239.00
Microsoft Works	185.00
MiniCAD 3.15+	399.00
MyDiskLabeler	21.00
Puppy Love	19.50
ReadySetGo	410.00
Scoop	call
Shadowgate	36.00
Smart Alarms	33.00
SuperLaserSpool	99.00
SuperPaint	89.00
VideoWorks II	129.00
WordPerfect	call

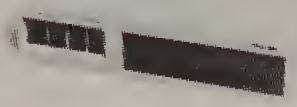
HARDWARE

Hard Disk Drives:
MagicDrives:

20 Meg	$549	30 Meg	$799
40 Meg	799	60 Meg	899
91 Meg	1399	151 Meg	1950

Everex EMAC-20D	525.00
Rodime 20Meg	499.00
ProApp 20S	649.00
CMS Drives	call
MacBottom 45	1239.00
ScripTEN Printer	3850.00
Dot Matrix Printer	225.00
Xerox 15" Monitor	1549.00
Magic 60MB Tape	699.00
Thunderscan 4.0	199.00
Scanners	call
A+ Optical Mouse	89.00
Turbo Mouse (+,SE,II)	87.00
800K Drive	185.00
2400 Baud Modem	199.00
1200 Baud Modem	99.00
Kensing. System Saver	67.00
MacVision	184.00
MacFan	88.00
Laser Printers	call
Accelerator Cards	call

SPECIALS!



20MEG DRIVES
Internal $399
External $499



1 MEG SIMMs
Only $199

Software Rentals
Try a product before you buy it. Rentals are only 1/5 of the purchase price. No Minimum.

DISKS & RIBBONS

Sony SS Boxed	11.60
Sony SS Bulk	1.04
Sony DS Boxed	16.80
Sony DS Bulk	1.34
MacDisk SS Bulk	.99
MacDisk DS Bulk	1.25
Black Ribbons	2.95
Colored Ribbons	4.50
Multicolored Ribbons	12.00

ACCESSORIES

MacPlus Bag	55.00
Mac SE Bag	69.00
Hypercard Handbook	21.00
The Macintosh Bible	19.50
Mouse Pad	10.95
Phone/Easy Net	49/29.00
Disk File/30	6.95
Teak 45 Disk Holder	15.00
Teak 90 Disk Holder	22.00
MAC SCREWDRIVER	9.95
Mac Calendar	8.00

MEMORY UPGRADES

128K-512K	115.00
128K-1024K	249.00
512K-1024K	149.00
512K-1024K Kit	99.00
128-2MB CMOS	599.00
SCSI Port	69.00
68020/68881	595.00
Dove Upgrades	call

* 6 Mo. - 3 Year Warranty
* Over 5000 Upgrades Completed
* Apple-compatible

Ordering Information
National: Call 1-800-622-3475
Texas: Call 1-800-2MAC-TEX
Hours: 7:30am-7:30pm CDT.
There Is a $40 minimum on all orders. We accept Visa, MasterCard, American Express (*), C.O.D., Company and Institution PO's, and checks. You are not charged until we ship your order. Texas residents please add 8% sales tax. Prices are subject to change and Items are subject to availability. Returns may be subject to a re-stocking fee. (* Surcharge)

Shipping Information
Minimum $4 additional. Federal Express, UPS Next Day & 2nd Day Air, US Mail.

MacProducts USA 9709 Brown Lane Suite E Austin Texas 78754 512-832-0335

Keep your business running true to form



FileMaker Plus. The data base and forms manager from Nashoba Systems.

The winner of top awards from both MacUser and Macworld is now the top-selling data base manager for the Macintosh.™ And for good reasons.

FileMaker® Plus is the first product for the Macintosh to combine professional data base management with the ability to produce professional quality forms.

FileMaker Plus makes it easy to quickly create any type of form you want: number-heavy forms like invoices, purchase orders and expense reports; and text-heavy forms like contracts and form letters. You can arrange drawings, photos, text, numbers, logos, and dates anywhere on the page for maximum impact, then preview what you've done on the screen to make sure it's exactly what you want. FileMaker Plus even includes templates for creating mailing labels, proposals, and Rolodex® cards.

FileMaker Plus makes managing your data base just as easy. It automatically indexes every word, number and date you enter. You can look up pricing information and quickly calculate, sort, and summarize your invoices, automate your sales reports, produce contact lists, form letters, and mailing labels. All from the same data, without retyping. You can also exchange information with other applications, like Microsoft® Word, Excel, MacWrite,® MacPaint,™ and MacDraw™ to help you share information and formats.

And FileMaker Plus is on friendly terms with the entire Macintosh family, including the Macintosh 512K, Macintosh Plus, Macintosh SE as well as the Macintosh II, the ImageWriter® II and LaserWriter® Plus, and the latest system software, such as MultiFinder™ and AppleShare.™

Nashoba Systems is just as committed to FileMaker Plus today as we were when we first developed it. We'll continue to do all the things that have made it such a success: listen to our customers, provide outstanding free technical support, upgrade our product with the most advanced technology in an easily accessible form, and assure your satisfaction with our money-back guarantee.*

FileMaker Plus from Nashoba Systems. For only $295, it keeps your business running in top form.

Call us today for the dealer nearest you. **1-800-274-0610.**



© 1987 Nashoba Systems, Inc. FileMaker is a registered trademark of Nashoba Systems, Inc. ImageWriter, LaserWriter and MacWrite are registered trademarks of Apple Computer, Inc. AppleShare, MacDraw, Macintosh, MacPaint and MultiFinder are trademarks of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Rolodex is a registered trademark of Insilco. *Money-back guarantee is available for thirty days from date of purchase. Details available upon request.

Circle 72 on reader service card

Where to Buy

This section contains information about products mentioned in this issue. Programs are not copy protected unless otherwise indicated. All prices are list prices. An asterisk indicates that a product review appears in this issue.

Public domain software and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Educomp, 742 Genevieve, Ste. D, Solana Beach, CA 92075, 619/259-0255, 800/843-9497, 800/654-5181 in California, or The Public Domain Exchange, 2074-C Walsh Ave., Dept. 609, Santa Clara, CA 95050, 408/496-0624, 800/331-8125.

Pages 104 to 107
Network Tales

AppleShare
Version 1.1. Apple Computer, Inc., 20525 Mariani Ave. , Cupertino, CA 95014, 408/996-1010. 512K minimum memory; requires hard disk, AppleTalk, and a dedicated Mac Plus. $799.

AST-4000
AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992, 714/553-0340. 512KE minimum memory; requires SCSI port for the Mac 512KE. 70MB hard disk $3699, 70MB hard disk and 60MB tape drive $5295, 140MB hard disk $5995.

Giga Cell 290T
NuData Inc., 3206 Scott Blvd., Santa Clara, CA 95054, 408/727-1049, 800/832-8268. 1MB minimum memory. $8550.

InterBridge
Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617. 512K minimum memory; requires Hayes-compatible 2400- or 9600-baud modem for remote bridge. $799.

InterMail
Version 1.35. Internet, 20 Amy Circle, Waban, MA 02168, 617/965-5239. 512K minimum memory; requires hard disk and AppleTalk. 1 to 4 users $349.95, 5 to 10 users $649.95, 11 to 20 users $999.95, 21 or more users $1499.95.

LaserShare
Version 1.0. Apple Computer, Inc. For address see *AppleShare*. 512K minimum memory; requires LaserWriter, AppleTalk, and a dedicated 512KE or Mac Plus. $299.

NetModem V1200
Shiva Corp., 222 Third St. #1200, Cambridge, MA 02142, 617/661-2026, 800/458-3550. 512K minimum memory; requires AppleTalk and communications software. $599.

TrafficWatch
Version 1.05. Farallon Computing, 2150 Kittredge St., Berkeley, CA 95709, 415/849-2331. 512K minimum memory; hard disk recommended. $195.

Pages 110 to 119
Shades of Gray

Abaton Scan 300
Abaton Technology Corp., 7901 Stoneridge Dr. #500, Pleasanton, CA 94566, 415/463-8822. 512K minimum memory. $2495.

Abaton Scan 300/FB
Abaton Technology Corp. For address see Abaton Scan 300. 512K minimum memory. $2295.

AST TurboScan
AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992, 714/553-0340. 512KE minimum memory; hard disk recommended. Flatbed version $1899, sheetfed version $1699.

Hewlett-Packard ScanJet
Hewlett-Packard, 3000 Hanover St., Palo Alto, CA 94304, 800/752-0900. 1MB minimum memory; requires ScanJet Macintosh Interface Kit. $1495, ScanJet Macintosh Interface Kit $595.

ImageStudio
Version 1.0. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9703. 1MB minimum memory; requires external drive; hard disk recommended. $495.

Imagizer
Comtrex Ltd., P.O. Box 1450, El Toro, CA 92630, 714/855-6600. 512K minimum memory; requires 800K drive storage and PostScript printer. Imagizer Complete System $2995, Imagizer Basic System $2695, Imagizer and Camera $1995, Imagizer alone $1295.

JetReader
Datacopy Corp., 1215 Terra Bella Ave., Mountain View, CA 94043, 415/965-7900. 1MB minimum memory; requires *MacImage Kit*. $1300.

MacScan
New Image Technology, Inc., 10300 Greenbelt Rd. #104, Seabrook, MD 20706, 301/464-3100. 1MB minimum memory. $1547.

MacScan FB
New Image Technology, Inc. For address see MacScan. 1MB minimum memory. $1995.

Magic
New Image Technology, Inc. For address see MacScan. 512K minimum memory. $399, optional black-and-white video camera $150.

Model 730
Datacopy Corp. For address see JetReader. 1MB minimum memory; requires *MacImage Kit*. $1800.

Model 840
Datacopy Corp. For address see JetReader. 1MB minimum memory; requires hard disk. Model 840 $4800, Model 840i $8995.

MS-300A
Microtek Lab., Inc., 16901 S. Western Ave., Gardena, CA 90247, 213/321-2121, 800/654-4160. 512K minimum memory. $2495.

MS-300C
Microtek Lab., Inc. For address see MS-300A. 512K minimum memory. $1795.

MSF-300C
Microtek Lab., Inc. For address see MS-300A. 512K minimum memory. $1895.

MSF-300G
Microtek Lab., Inc. For address see MS-300A. 1MB minimum memory; Mac II and hard disk recommended. Price to be announced.

PC Scan
Dest Corp., 1202 Cadillac Ct., Milpitas, CA 95035, 408/946-7100, 800/538-7582. 1MB minimum memory; hard disk recommended. $1995.

PC Scan Plus
Dest Corp. For address see PC Scan. 1MB minimum memory; hard disk recommended. $2495.

PC Scan 1000
Dest Corp. For address see PC Scan. 1MB minimum memory; hard disk recommended. $1695.

PC Scan 2000
Dest Corp. For address see PC Scan. 1MB minimum memory; hard disk recommended. $1495.

ProViz
Pixelogic, 800 W. Cummings Park #2900, Woburn, MA 01801, 617/938-7711. 1MB minimum memory; hard disk recommended. $1595.

ThunderScan
Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563, 415/254-6581. 512K minimum memory; requires ImageWriter I or II; hard disk and 1MB or more RAM recommended. $249.

TZ-3
Truvel Corp., 8943 Fullbright Ave., Chatsworth, CA 91311, 818/407-1031. 1MB minimum memory; requires SCSI Interface; hard disk recommended. $4995, SCSI Interface $995.

Pages 120 to 127
HELP!

CJS Systems, 3051 Adeline St., Berkeley, CA 94703, 415/849-3730.

Computer Hand Holding, 1800 Market St. #91, San Francisco, CA 94102, 415/864-2343.

Pages 128 to 137
The Ethernet Solution

Alisa TSSnet
Version 1.2. Alisa Systems, 221 E. Walnut St. #230, Pasadena, CA 91101, 818/792-9474. 512KE minimum memory. One to nine copies $349 each, ten or more copies $299 each.

AlisaTalk
Version 2.0. Alisa Systems. For address see Alisa TSSnet. Compatible with DEC VAX/VMS systems; requires AppleTalk network, Ethernet, and FastPath from Kinetics. $3750 to $11,500.

AST-ICP
AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992, 714/553-0340. Requires Mac II and access to UNIX. $999.

CommUnity for the Macintosh
Version 1.0. Technology Concepts Inc., 40 Tall Pine Dr., Sudbury, MA 01776, 617/443-7311, 800/777-2323. Key-disk copy protection. 1MB minimum memory; requires FastNet Box and access to Ethernet; hard disk recommended. $400 per user, $200 for documentation and media.

Du Pont Fiber-Optic LAN for AppleTalk
Du Pont Electronics, 515 Fishing Creek Rd., New Cumberland, PA 17070, 717/938-7683, 800/237-2374. 512K minimum memory; requires AppleTalk. $700 to $1100 per node.

EtherLink/NuBus
3Com Corp., 3165 Kifer Rd., Santa Clara, CA 95052, 408/562-6400. Compatible with Mac II; requires Ethernet cable. Price to be announced.

EtherPort SE
Kinetics, Inc., 2500 Camino Diablo, Walnut Creek, CA 94596, 415/947-0998. 1MB minimum memory; requires Mac SE. $850.

EtherSC
Kinetics, Inc. For address see EtherPort SE. 512K minimum memory. $1250.

FastNet CCU
Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405, 919/763-7918, 800/622-7627. 512KE minimum memory; requires SCSI Port for 512KE. $899 without transceiver, $999 with transceiver.

FastPath
Kinetics, Inc. For address see EtherPort SE. 128K minimum memory. $2500.

K-Talk
Kinetics, Inc. For address see EtherPort SE. 128K minimum memory; requires access to UNIX; 512K recommended. K-Talk Source Code $3500 per CPU, K-Talk Binary Code $875 per CPU.

Macintosh II EtherTalk Interface Card
Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 1MB minimum memory; requires Mac II, other requirements depend on operating system and protocol configurations. $699.

MultiConnect
3Com Corp. For address see EtherLink/NuBus. Requires PairTamer Set and twisted-pair cable. Base unit $1095, Transceiver Interface Module $175, BNC Module $230.

PairTamer
3Com Corp. For address see EtherLink/NuBus. Requires Ethernet controller and transceiver. $325.

pcLink
Version 3.0. Pacer Software, Inc., 7911 Herschel Ave. #402, La Jolla, CA 92037, 619/454-0565. 512K minimum memory; requires 800K of drive storage. 5 users $2000, 20 users $5000, 50 users $10,000, 100 users $15,000, 250 users $25,000, 500 users $37,500.

3+ for the Macintosh
3Com Corp. For address see EtherLink/NuBus. Requires Mac SE or Mac II, and 3S/200. $495.

TOPS
Version 2.0. TOPS, A Sun Microsystems Company, 2560 Ninth St. #220, Berkeley, CA 94710, 415/549-5900. 512K minimum memory; requires AppleTalk; hard disk recommended. TOPS/Macintosh $189, TOPS/DOS $189, TOPS FlashCard $239.

TOPS Terminal
Version 1.0. TOPS, A Sun Microsystems Company. For address see *TOPS*. 512K minimum memory; requires AppleTalk and Kinetic FastPath. $189.

Pages 138 to 145
The PostScript Difference

Adobe Illustrator
Version 1.11. Adobe Systems Inc., P.O. Box 7900, Mountain View, CA 94039-7900, 415/961-4400. Key-disk copy protection; unprotected disk will be sent to registered owners. 1MB minimum memory; scanning device recommended. $495.

Click & Clip
Studio Advertising Art, P.O. Box 18432-52, Las Vegas, NV 89114, 800/235-6646, 800/235-6647 in California. 1MB minimum memory; requires application that reads encapsulated PostScript files. $39.95 per issue, $67 for two issues, $124.50 for four issues.

ClickArt EPS Images
T/Maker Co., 1973 Landings Dr., Mountain View, CA 94043, 415/962-0195. 1MB minimum memory; requires application that reads encapsulated PostScript files. Each volume $129.95.

Collage
PS Publishing, Inc., 290 Green St. #1, San Francisco, CA 94133, 415/433-4698. 1MB minimum memory; hard disk recommended. Price to be announced.

(continues)

CDA computer sales

ORDERS ONLY PLEASE . . . TOLL FREE 800-526-5313

—MAJOR CREDIT CARDS ACCEPTED—
• VISA • MASTERCARD • AMERICAN EXPRESS
• OPTIMA • DISCOVER

WORLDWIDE
MAILORDER
SINCE 1978

HARDWARE

Apple	
Macintosh Plus	$1599
Apple 3.5 Drive	319
Macintosh SE w/keyboard	2249
Macintosh SE20 w/keyboard	2899
Apple Extended Keyboard	199
1 Megabyte Upgrade (4 256K SIMMS)	200
2 Megabyte Upgrade (2 1 Megabyte SIMMS)	500
AST Research	
AST Mac 86	429
AST-PAK 1 MEG/SE	389
Central Point	
800K Drive	185
Covercraft	
Deluxe Carrying Case SE	89
Dove	
Mac Snap 524 (Mac 512)	149
Mac Snap 524E (Mac 512E)	149
Mac Snap 524S (Mac 512E)	239
Mac Snap 548S (Mac 512E)	519
Mac Snap Plus 2 (Mac Plus)	299
Mac Snap SCSI	129
Ehman	
800 K Drive	199
Kensington	
SystemSaver Mac	69
Turbo Mouse 512/Plus	89
Turbo Mouse MacSE/II	89
MacTilt/Swivel	29
Printer Muffler 80	49
Mouse Pocket	9
MouseWay-Mouse Pad	9
Koala Technologies	
MacVision	199
MacMemory Inc.	
Turbo SE	449
Thunderware	
Thunderscan	199

MACINTOSH II

Apple Hardware	
Macintosh II w/ext Keyboard	$3149
Macintosh II 40 w/ext Keyboard	4399
Mac II Video Display Adapt	399
Mac II Video Expansion Kit	99
Mac II Monochome Monitor	329
Mac II RGB Monitor	799
PC 5.25 Drive	329
Mac II Drive Card	109
AST Research	
AST Mac 286	1079
AST ICP-2 Comm Processor	749
AST ICP-4 Comm Processor	799

MONITORS

E-Machines	
Big Picture	$1595
Nec	
Multisync Plus JC-1501	999
Multisync XL JC-2001	2395
Sigma Designs	
Laserview 15" Mono (SE/MacII)	1365
Laserview 19" Mono (SE/MacII)	1739
Sony	
Multiscan RGB Analog 1302 (II)	699
SuperMac	
SuperView (HiRes MonoCard/SE)	297
Graphix (HiRes Mono Card/II)	379
19" Monochrome Monitor	1288
Super Spectrum Color Card	1149
19" Color Monitor	2395

PRINTERS

(pricing includes cables)	
Apple Imagewriter II	$479
Apple Imagewriter Sheetfeeder	179
Apple Imagewriter LQ	1099
Apple Laserwriter	3599
Apple Laserwriter Plus	4099
AST TurboLaser PS	3195
Brother Dynax-21	399
Orange Grappler Mac	69
Orange Grappler Mac 24 Wire	69
NEC LC-890	3695
QMS PS-800 (LaserConnection)	4095

— Complete Ready-to-Run Systems —

Macintosh Plus Entry System

System includes:
- Macintosh Plus Computer with 1 Megabyte of Ram, Keyboard and Mouse, 1 Internal 800 K Floppy
- Ehman 8000K External Floppy Drive
- Imagewriter II Printer
- Printer Cable
- HyperCard Software
- Maxell Diskettes Box of 10
- Computer Paper Package of 500
- Dust Cover for Macintosh Plus
- Dust Cover for Imagewriter II
- Head Cleaning Kit
- Mouse Pad

Suggested list price $3450 **CDA Price $2399**

When ordering specify package #8801

Macintosh SE Super System

Complete System includes:
- Macintosh SE Computer with 2 Internal 800K Drives 1 Megabyte of Memory Keyboard and Mouse
- Imagewriter II Printer
- Imagewriter Cable
- HyperCard Software
- HyperCard Software
- Maxell Diskettes Box of 10
- Dust Cover for Macintosh SE
- Dust Cover for Imagewriter II
- Head Cleaning Kit
- Mouse Pad

Suggested list price $3689 **CDA Price $2749**

When ordering specify package #8802

Macintosh SE/20 Super System

Same as the above system but includes the Macintosh SE with built in 20 megabyte hard disk and 1 internal 800K floppy!

Suggested list price $4489 **CDA PRICE $3349**

When ordering specify package #8803

Macintosh II/40 Graphic System

Complete System includes:
- Macintosh II Computer with 40 Megabyte Hard Drive 1 Megabyte of Memory Extended Keyboard and Mouse
- Machintosh II Video Card
- Apple Color High Resolution RGB Monitor
- Imagewriter II with Cable
- HyperCard Software
- Maxell Diskettes Box of 10
- Case of Computer Paper 1100 Sheets
- Dust Cover for Macintosh II Monitor
- Dust Cover for Extended Keyboard
- Head Cleaning Kit
- Mouse Pad

Suggested list price $7849 **CDA Price $5999**

When ordering specify package #8805

Above system with 20 Megabyte Hard Disk specify package #8804
CDA Price $5399

Above system with 80 Megabyte Hard Disk specify package #8806
CDA Price $6999

SYSTEM OF THE MONTH!

Deluxe Desktop Publishing System

Complete System includes:
- Macintosh II Computer with 40 Megabyte Hard Drive 1 Megabyte of RAM Extended Keyboard and Mouse
- Cornerstone 19" Monochome Monitor
- AST TurboLaser PS Printer
- TurboLaser Cable
- Scoop by Target Page Layout Software
- HyperCard Software
- Microsoft Word 3.0 Software
- Box of 10 Maxell Disketts
- Dust Cover for Extended Keyboard
- Head Cleaning Kit
- Mouse Pad

Suggested list price $13295 **CDA Price $9995**

When ordering specify package #88057

MODEMS AND COMMUNICATIONS

Pricing includes Modem Cable

Apple	
Apple Personel Modem	$319
Hayes	
Smartmodem 1200	319
Smartmodem 2400	479
Smartmodem 1200 Mac includes Smartcom	399
Prometheus	
Promodem 1200 Expandable	249
Promodem 1200 Non-Exp	179
Promodem 2400 Expandable	349
Promodem 2400 Non-Exp	599
Mac Pac ProCom	39
Software	
Apple MacTerminal	95
Hayes SmartCom II	95
Prometheus ProCom M	39
Modem Cables	
Macintosh 128/512	19
Macintosh Plus/SE/II	19

SOFTWARE

HyperCard	$42
Mac Draw	149
MacPaint	99
MacProject	149
MacWrite	99
Switcher	15
Word 3.01	249
Excel	229

HARD DRIVES

Apple	
Hard Disk 20	$1119
Hard Disk 40	1689
Hard Disk 80	2659
CMS	
20 Megabyte MacStack	595
43 Megabyte MacStack	895
60 Megabyte MacStack	1049
80 Megabyte MacStack	1335
140 Megabyte MacStack	2295
40 Megabyte TapeStack	769
140 Megabyte Subsystem	2579
320 Megabyte Subsystem w/Tape 5(ms access)	9799
PCP	
MacBottom 21 Meg	749
MacBottom 30 Meg	899
MacBottom 45 Meg	1149
MacBottom 20 w/modem	899
MacBottom 30 w/modem	1049
MacBottom 40 w/modem	1299
MacBottom 20S (Mac512)	875
SuperMac	
Dataframe XP30	899
Dataframe XP60	1299
Dataframe XP60 +40 Tape	1849
Rodime	
20 Plus	739
45 Plus	1139

INTERNAL HARD DRIVES

Apple	
Hard Disk 20 MacSE II	$809
Hard Disk 40 MacII	1295
Hard Disk 80 MacII	2190
CMS	
Pro 20 MacII (65ms)	509
Pro 40 MacSE II (29ms)	965
Pro 43 MacII (40ms)	895
Pro 60 MacII (40ms)	1095
Pro 80 Mac II (26ms)	1295
Pro 102 Mac II (28ms)	1485
Pro 140 Mac II (28ms)	2195
Rodime	
20 Plus MacPlus	799
45 Plus MacPlus	1179
450 RX 45 Meg MacSE	1175
1000 RX 100 Meg MacII	2199
1400 RX 140 Meg MacII	2579

NO-RISK 30-DAY SATISFACTION GUARANTEE If you're not 100% satisfied with any Hardware or Accessories purchased from CDA Computer Sales, we will refund your purchase price 100% no questions asked! • **FREE TECHNICAL SUPPORT** We support our customers with knowledgable technicians on all products we sell. • **ORDER VIA TELEPHONE** - Toll-Free 800-526-5313, in N.J. 201-728-8080 • **ORDER VIA MAIL** - Write: CDA Computer Sales P.O. Box 648, West Milford, NJ 07480. Please include full name, address, phone number • **ORDER VIA COMPUSERVE'S ELECTRONIC MALL** - 24 hours a day! GO CDA • **FREIGHT** - UPS ground shipping -add 2% of total order ($3.50 minimum); APO/FPO - add 4% ($4.50 minimum), Alaska, Hawaii, PR add 6% ($6.50 min.). Two-Day Delivery, Overnight Delivery and Foreign Orders -Please Call. • **CUSTOMER SERVICE** -201-728-8082 9am-5pm EST • **EXPANDED HOLIDAY HOURS** - Nov. & Dec. - Mon.-Fri. 9am-12pm/Sat. 10am-6pm/Sun. 12pm-6pm.

Circle 795 on reader service card

Where to Buy

Cricket Draw
Version 1.1. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512KE minimum memory; external drive and LaserWriter recommended. $295.

Digit-Art Volume 3
Image Club Graphics Inc., 2915 19th St. NE #206, Calgary, Alberta, Canada T2E 7A2, 403/250-1969. 512K minimum memory; requires application that reads encapsulated PostScript files; PostScript printer recommended. $149.

Kwikee Inhouse Graphics Services
Version 1.03. Multi-Ad Services, 1720 W. Detweiller Dr., Peoria, IL 61615, 309/692-1530, 800/447-1950, 800/322-3941 in Illinois. 1MB minimum memory; requires CD player; hard disk recommended. $220 per month, $600 per quarter, $2250 per year.

LaserPaint
Version 1.2. LaserWare, Inc., P.O. Box 668, San Rafael, CA 94915, 415/453-9500, 800/367-6898. 1MB minimum memory; external drive or hard disk recommended. $495.

LaserTalk
Version 1.0. Emerald City Software, Inc., 97 Jennings Ln., Atherton, CA 94025, 415/368-8303. 1MB minimum memory; requires PostScript printer. $245.

Post-Art
Olduvai Software, Inc., 7520-A Red Rd., South Miami, FL 33143, 305/665-4665. Minimum memory depends on application; requires application that reads PostScript files. Each volume $69.95.

Page 152
Power PostScript Printing

VT600
Varityper, 11 Mount Pleasant Ave., East Hanover, NJ 07936, 201/887-8000 ext. 999, 800/631-8134. 128K minimum memory; requires AppleTalk. $18,750.*

Page 153
Because the World Is Round

Dimensions
Version 1.18. Visual Information, Inc., 16390 Double Grove, La Puente, CA 91744, 818/918-8834. 1MB minimum memory; requires external drive. Design Dimensions: Mac Plus and SE version $750, Mac II version $1395. Solid Dimensions: Mac Plus and SE version $395, Mac II version $1295.*

JDL-850 GL+
Japan Digital Laboratory, 2801 Townsgate Rd. #104, Westlake Village, CA 91361, 805/495-3451. 512K minimum memory. $3845.

MSC/pal
Version 1.95. The MacNeal Schwendler Corp., 815 Colorado Blvd., Los Angeles, CA 90041, 213/259-3888, 800/336-4858. 1MB minimum memory; requires external drive; hard disk recommended. $1495.

PlotMaster
CalComp, 2411 W. LaPalma Ave., Anaheim, CA 92801, 714/821-2000. 512K minimum memory; requires *MacPlot* software. $4995.

Page 155
Freedom from the Mouse

QuicKeys
Version 1.0. CE Software, Inc., 801 73rd St., Des Moines, IA 50312, 515/224-1995. 512KE minimum memory; requires System 4.1 or later. $99.95.*

Page 156
Heavy-Duty Design

PowerTools
Version 1.3. Iconix Software Engineering, Inc., 1037 Third St. #105, Santa Monica, CA 90403, 213/458-0092. Key-disk copy protection; installs on hard disks. 512K minimum memory; external drive or hard disk recommended. $3295.*

Page 157
A Graphics Workhorse

Canvas
Version 1.02. Deneba Software, 7855 N.W. 12th St. #202, Miami, FL 33126, 305/594-6965, 800/622-6827. 512KE minimum memory; requires System 4.1 or later version; external drive or hard disk recommended. $195, *Canvas DA* $99.95.*

Page 158
Come On, Let's Go

Go for the Macintosh
Version 1.011. Infinity Software, Inc., 1144 65th St., Ste. C, Emeryville, CA 94608, 415/420-1551. 512K minimum memory; 512KE recommended. $39.95.*

Page 159
A Tutor for Freshman Physics

Physics
Version 1.0. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101, 415/492-3200. Key-disk copy protection. 512K minimum memory; requires external drive. $99.95.*

Page 160
It Won't Necessarily Get the Job

ResuméWriter
Version 1.0. Bootware Software Co., 28024 Dorothy Dr., Agoura Hills, CA 91301, 818/706-3887. Key-disk copy protection. 128K minimum memory for student version, 512KE minimum memory for professional version; external drive recommended. Student version $30, professional version $100.*

Page 161
Chromatic Options

Modern Artist
Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229, 503/626-2291. 1MB minimum memory; requires Mac II; hard disk recommended. $199.*

SuperChroma
Computer Friends, Inc. For address see *Modern Artist*. 512K minimum memory. $1500, Enhanced Video Option $1500, Hi-Resolution Monitor $650.*

Shinko Color Printer
Computer Friends, Inc. For address see *Modern Artist*. 512K minimum memory; requires SuperChroma for Mac 512K, Plus, or SE, or parallel interface card for Mac II. CHC335 $4500, CHC65 $8990.

Page 162
This Base Is Loaded

1stFile
Version 3.5. 1stDesk Systems, Inc., 7 Industrial Park Rd., Medway, MA 02053, 617/533-2203, 800/522-2286. 128K minimum memory. $95, multiuser version $295.*

1stMerge
Version 3.5. 1stDesk Systems, Inc. For address see *1stFile*. 128K minimum memory. $95, multiuser version $195.*

1stPort
Version 3.5. 1stDesk Systems, Inc. For address see *1stFile*. 128K minimum memory. $295.*

1stScan
Version 3.5. 1stDesk Systems, Inc. For address see *1stFile*. 128K minimum memory. $195, multiuser version $295.*

Page 163
A Concert in PostScript

ConcertWare+
Version 4.00. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-1990. 512K minimum memory; external drive or hard disk recommended. $69.95.*

ConcertWare+ MIDI
Version 4.00. Great Wave Software. For address see *ConcertWare+*. 512K minimum memory; requires MIDI adapter when used with MIDI instruments; external drive or hard disk recommended. $149.95.*

Page 165
Piece of Mind

Mac-ESP
Version 1.4. Psy-Den America Corp., 44 W. Service Rd., Box 248, Champlain, NY 12919, 514/737-2248, 800/361-2591. 512K minimum memory; hard disk recommended. $49.95.*

Subli-Mac
Version 2.0. Psy-Den America Corp. For address see *Mac-ESP.* 512K minimum memory. $39.95.*

Page 166
Getting on the Bus

GPIB-SE
National Instruments, 12109 Technology Blvd., Austin, TX 78727, 512/250-9119, 800/531-4742, 800/433-3488 in Texas. 1MB minimum memory; requires Mac SE. Controller board alone $495, with DMA option $795, with optional 68881 floating-point math coprocessor $995, with both the DMA and 68881 options $1295.*

LabVIEW
Version 1.1. National Instruments, 12109 Technology Blvd., Austin, TX 78727, 512/250-9119, 800/531-4742, 800/433-3488 in Texas. 1MB minimum memory; requires external drive; hard disk recommended. $1995.

Page 167
A New Image

AST TurboScan
AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992, 714/553-0340. 512KE minimum memory; hard disk recommended. $1899.*

Page 168
QUED Pro Quo

QUED/M
Version 2.04. Paragon Concepts, Inc., 4954 Sun Valley Rd., Del Mar, CA 92014, 619/481-1477, 800/922-2993. 512K minimum memory. $119.*

Page 169
Fry the Unfriendly Skies

Tactical Jet Fighter
Version 1.0. Electronic Systems & Software Inc., 199 N. El Camino, Ste. F-208, Encinitas, CA 92024, 619/942-0823. Key-disk copy protection. 128K minimum memory. $44.95.*

Pages 219 to 225
Insights on Adobe Illustrator

Adobe Illustrator
Version 1.11. Adobe Systems Inc., P.O. Box 7900, Mountain View, CA 94039-7900, 415/961-4400. Key-disk copy protection; unprotected disk will be sent to registered owners. 1MB minimum memory; scanning device recommended. $495.

ThunderScan
Version 4.0. Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563, 415/254-6581. 512K minimum memory; requires ImageWriter I or II; hard disk and 1MB or more RAM recommended. $249.

Pages 227 to 244
Mac Charting Tools

Designer's Guide to Creating Charts and Diagrams
Watson-Guptill Publications, 1515 Broadway, New York, NY 10036, 212/764-7300. $32.50.

Doug Cobb's Tips for Microsoft Excel
Microsoft Press, 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. $19.95.

Excel in Business
Microsoft Press. For address see *Doug Cobb's Tips for Microsoft Excel.* $22.95.

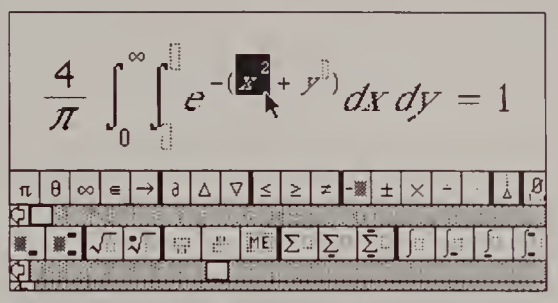
Hand-On Excel
Scott, Foresman & Co., 1900 E. Lake Ave., Glenview, IL 60025, 312/729-3000. $21.95.

Microsoft Excel
Version 1.04. Microsoft Corp. For address see *Doug Cobb's Tips for Microsoft Excel.* 512K minimum memory; external drive recommended. $395. □

MathType

The Mathematical Equation Editor for the Macintosh

Edit equations like this:



And get LaserWriter output like this:

$$\frac{4}{\pi}\int_0^{\infty}\int_0^{\infty} e^{-(x^2+y^2)}\,dx\,dy = 1$$

MathType™ knows the rules of mathematical typesetting, so all you do is point, click, and type. Works with any word processor or page layout program. MathType is available now for only $149. Educ. discounts applicable. Call or write for a free demo disk and brochure with sample output.

Design Science

6475-B East Pacific Coast Highway, Suite 392
Long Beach, CA 90803 • (213) 433-0685

MathType is a trademark of Design Science, Inc. Macintosh and LaserWriter are trademarks of Apple Computer Inc.

Circle 606 on reader service card

Telecom Software Review

1-800-MAC-TSR0
(1-800-622-8770)

16 Day Leases on Mac Software
All Fees Apply To Purchase Price

Canvas-23.90, Cricket Draw-42.90, dBase Mac-64.90, Full Paint-13.90, Games-7.90/up, GraphicWorks 1.1-15.90, McMax-38.90, MiniCad-74.90, PowerPoint-52.90, Rags To Riches-27.90, RSG4-61.90, ReflexPlus-32.90

Plus Hundreds Of Other Programs

CMS SCSI Drives
20 Meg $579
43 Meg $879
60 Meg $959
80 Meg $1325
MacScan LS 300 $1257
2400 Modems $199 to $229

Our Second Year for the Business Mac

TSR
8177 S. Harvard – Suite 336
MasterCard **Tulsa, OK. 74137** Visa
Natl. 800-622-8770 In Ok. 918-496-1140
Call or Write For Free Catalog And Rates

Circle 769 on reader service card

Product Index

Reader Service Number

Software

Business

212 ABA, 231
— Adobe Systems, 80
1 Adobe Systems, 81
678 Adobe Systems, 52-53
581 Check Mark Software, 214
776 Compatible Systems Corp., 191
606 Design Science Inc., 275
355 Dow Jones Software, 190
410 Educomp, 269
168 EZware Corp., 193
— GE Information Systems, 64
316 Infosphere, 82
249 Infosphere, 82
119 LaCie, 40
598 Letraset, 170-171
278 Letraset, 172
— Living Video Text, 10, 216
781 Macromind Inc., 90
653 Macropac, 85
— Microsoft, IFC-1, 36-37, 102-103
72 Nashoba, 270
559 North Edge Software, 61
144 Peachtree Software, 246
560 Personal Training Systems, 44
242 Positive Works, 86
178 Softview, 218
625 Software Ventures, 16
225 Statsoft, 42
— SuperMac, 30, 58, 62, 96
96 Think Technology, 7
524 TOPS, 21
591 Value Line, Inc., 59
40 Wordperfect, 26-27

Vertical

581 Check Mark Software, 214
— Satori Software, 35

Data Management

653 Macropac, 85
72 Nashoba, 270

Word Processing

606 Design Science Inc., 275
— Living Video Text, 10, 216
774 Microlytics, 183
37 Miles Computing, 76
— SuperMac, 30, 58, 62, 96
332 T/Maker, IBC
40 Wordperfect, 26-27

Communications

622 Abaton Technology Corp., outsert
616 DCA, 56-57
232 Dayna Communications, 72
316 Infosphere, 82
249 Infosphere, 82
119 LaCie, 40
775 Palantir, 46
625 Software Ventures, 16
704 3Com, 194
524 TOPS, 21
231 White Pine Software, 234

Educational

20 Bible Research, 42
606 Design Science Inc., 275
560 Personal Training Systems, 44
632 Resonate, 232

Graphics/Desktop Publishing

18 ABA, 233
— Adobe Systems, 80
1 Adobe Systems, 81
678 Adobe Systems, 52-53
227 Altsys, 244
757 Casadyware, 84
384 Cricket Software, 6
684 Cricket Software, 184
621 Deneba, 60
410 Educomp, 269
791 GW Instruments, 182
597 Image Club, 38
598 Letraset, 170-171
278 Letraset, 172
— Living Video Text, 10, 216
37 Miles Computing, 76
407 Software Supply, 205
415 Software Supply, 207
703 Studio Advertising Art, 196
332 T/Maker, IBC

Personal Business/Home

604 CE Software, 98
— GE Information Systems, 64
178 Softview, 218

Entertainment

20 Bible Research, 42
301 Budgetbytes, 189
301 Budgetbytes, 189
37 Miles Computing, 76
211 Practical Computer Applications, Inc., 33
632 Resonate, 232
266 Silicon Beach, 63, 65
110 XOR, 203
265 XOR, 199
68 XOR, 201
146 XOR, 197

Utilities

628 1st Aid Software, 46
312 Fifth Generation Systems, 198
653 Macropac, 85
407 Software Supply, 205
415 Software Supply, 207
70 Virginia Systems, 196

Miscellaneous

301 Budgetbytes, 189
581 Check Mark Software, 214
330 Compuserve, 177
410 Educomp, 269
— MacProducts Marketing, 276
560 Personal Training Systems, 44
632 Resonate, 232
693 Safeware, 277
178 Softview, 218
407 Software Supply, 205
415 Software Supply, 207
— SuperMac, 30, 58, 62, 96
769 TSR, 275
537 Uptime, 5

Hardware

Printers

143 General Computer, 74-75
767 Laser Connection, 215
706 Laser Connection, 213
720 Laser Connection, 211
575 Orange Micro, 226
48 Varityper, 235

Boards

776 Compatible Systems Corp., 191
498 DoveComputer, 202
714 Microtek, 92
196 National Semiconductor, 94
413 PerfecTEK, 34
670 PerfecTEK, 186
704 3Com, 194

Digitizers/Scanners

615 DEST Corp., 14-15
714 Microtek, 92
725 Princeton Graphics, 208
176 Thunderware, 192

Display

600 E-Machines Inc., 8-9
609 MegaGraphics, 204
640 Mitsubishi, 189
642 Mitsubishi, 191
645 Mitsubishi, 193
779 Moniterm, 47
656 Princeton Graphics, 18-19
585 Radius, 79
577 Radius, 77
743 Sigma Design, 39

Modems

593 Club American Technologies, Inc., 88
612 Epic Technology, Inc., 28

Hard Disks/Storage

627 Bering Industries, Inc., 54
593 Club American Technologies, Inc., 88
657 CMS Enhancements, 221
619 CMS Enhancements, 223
312 Fifth Generation Systems, 198
586 In Focus, 217
457 Jasmine Technology, 45
641 Jasmine Technology, 43
605 Jasmine Technology, 239
747 Jasmine Technology, 83
119 LaCie, 40
206 Mass Micro, 67
764 Mass Micro, 66
352 Micah Storage, 188
411 National Data Products, 248
— NuData, 181
718 Open Mac System, 280
223 Personal Computer Peripherals, 13
729 Personal Computer Peripherals, 13
— SuperMac, 30, 58, 62, 96
769 TSR, 275
439 Warp Nine, 31

Miscellaneous

622 Abaton Technology Corp., outsert
700 Asher Engineering, 212
797 Ashton-Tate, 22-23
271 Computer Friends, 180
232 Dayna Communications, 72
586 In Focus, 217
— MacProducts Marketing, 276
609 MegaGraphics, 204
470 Microtech Intl., Inc., 243
714 Microtek, 92
397 MSC Technologies, 187
575 Orange Micro, 226
184 Secure-It, 234
704 3Com, 194

Accessories

Floppy Disks/Holders

490 Bede Tech, 200
562 Diskette Connection, 224
— Maxell, 291
210 Sony Corp., 25

Miscellaneous

622 Abaton Technology Corp., outsert
700 Asher Engineering, 212
41 Bantam Books, 229
373 Best Computer Supplies, 100
676 Ergotron, 87
123 Grimes Company, 242
592 Inmac, 207
530 I/O Design, 78
11 Kensington, BC
609 MegaGraphics, 204
27 Velobind, 206

Mail Order

795 CDA, 273
134 Comark/USA Flex, 228
371 Computer Mail Order, 174-175
272 Icon Review, 48-51
— MacConnection, 146-151
599 Mac Group, The, 225
— MacProducts Marketing, 276
411 National Data Products, 248
194 Programs Plus, 68-71
334 Public Domain Exchange, The, 277
587 Saltspring Software, 269
398 Telemart Computer Warehouse, 237
769 TSR, 275
483 Tussey, 241

CANADIAN MACINTOSH OWNERS!

SaltSpring Software is Canada's National Macintosh software mail order house.

Features:

- Prices approximately 30% below retail
- Canada wide toll free ordering line
- Free shipping via fully insured couriers
- 48 hour delivery to most destinations
- All products new and fully guaranteed
- No custom delays or duties
- No expensive telephone calls or shipping charges
- Large selection of over 300 Macintosh software packages
- VISA and MasterCard accepted

Canadian Orders Only

SaltSpring Software Inc

1-800-265-3492 10am to 10pm (EST)

Place your order today. Free catalogue available.

Circle 587 on reader service card

MACWORLD

The Macintosh™ Magazine

Free Product Information Service

Get more information on products you're interested in – simply return one of these cards today. There's no cost. And no obligation.

1. Your primary job function:
a. Corporate or general manager
b. Department manager
c. MIS or micro manager
d. Engineering or scientific
e. Professional
f. Reseller/VAR
g. Self-employed
h. Other

2. Number of employees in your company:
1. 25 or fewer
2. 26-99
3. 100-499
4. 500-999
5. 1000 or more

3. Plan to buy:
a. Now
b. In 4-6 months
c. In 7-12 months
d. More than 12 months from now
e. For reference only

4. For how many personal computers do you buy products? (Include both company and personal units, please.)
1. 1
2. 2-4
3. 5-9
4. 10 or more

5. How many of the above are Macintoshes?
a. 1
b. 2-4
c. 5-9
d. 10 or more

It's easy to get more information on products advertised in *Macworld*. Here's how:

- Print or type your name and address and circle the appropriate answer to each question
- Circle the numbers that correspond to the reader service numbers for the products that interest you. These numbers appear in the ads and in the Advertiser Index
- Apply first-class postage before mailing.

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264
265	266	267	268	269	270	271	272	273	274	275	276
277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312
313	314	315	316	317	318	319	320	321	322	323	324
325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348
349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372
373	374	375	376	377	378	379	380	381	382	383	384
385	386	387	388	389	390	391	392	393	394	395	396
397	398	399	400	401	402	403	404	405	406	407	408
409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441	442	443	444
445	446	447	448	449	450	451	452	453	454	455	456
457	458	459	460	461	462	463	464	465	466	467	468
469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492
493	494	495	496	497	498	499	500	501	502	503	504
505	506	507	508	509	510	511	512	513	514	515	516
517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550	551	552
553	554	555	556	557	558	559	560	561	562	563	564
565	566	567	568	569	570	571	572	573	574	575	576
577	578	579	580	581	582	583	584	585	586	587	588
589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612
613	614	615	616	617	618	619	620	621	622	623	624
625	626	627	628	629	630	631	632	633	634	635	636
637	638	639	640	641	642	643	644	645	646	647	648
649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672
673	674	675	676	677	678	679	680	681	682	683	684
685	686	687	688	689	690	691	692	693	694	695	696
697	698	699	700	701	702	703	704	705	706	707	708
709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732
733	734	735	736	737	738	739	740	741	742	743	744
745	746	747	748	749	750	751	752	753	754	755	756
757	758	759	760	761	762	763	764	765	766	767	768
769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792
793	794	795	796	797	798	799	800	999			

Please print or type all information

Name

Title

Company

Address

City, State, Zip (zip code needed to ensure delivery)

Phone Area code Number

PLEASE NOTE: This card is for your convenience in obtaining information on products advertised in *Macworld*. Please send editorial comments or inquiries to The Editor, *Macworld*, 501 Second St. #600, San Francisco, CA 94107.

S1

Valid through 4/19/88

Circle number 999 to subscribe to *Macworld*. We will bill you $30 for a 1-year (12-issue) subscription (U.S. only).

January 1988

MACWORLD

The Macintosh™ Magazine

Free Product-Information Service

Get more information on products you're interested in – simply return one of these cards today. There's no cost. And no obligation.

1. Your primary job function:
a. Corporate or general manager
b. Department manager
c. MIS or micro manager
d. Engineering or scientific
e. Professional
f. Reseller/VAR
g. Self-employed
h. Other

2. Number of employees in your company:
1. 25 or fewer
2. 26-99
3. 100-499
4. 500-999
5. 1000 or more

3. Plan to buy:
a. Now
b. In 4-6 months
c. In 7-12 months
d. More than 12 months from now
e. For reference only

4. For how many personal computers do you buy products? (Include both company and personal units, please.)
1. 1
2. 2-4
3. 5-9
4. 10 or more

5. How many of the above are Macintoshes?
a. 1
b. 2-4
c. 5-9
d. 10 or more

It's easy to get more information on products advertised in *Macworld*. Here's how:

- Print or type your name and address and circle the appropriate answer to each question
- Circle the numbers that correspond to the reader service numbers for the products that interest you. These numbers appear in the ads and in the Advertiser Index.
- Apply first-class postage before mailing.

Please print or type all information

Name

Title

Company

Address

City, State, Zip (zip code needed to ensure delivery)

Phone Area code Number

PLEASE NOTE: This card is for your convenience in obtaining information on products advertised in *Macworld*. Please send editorial comments or inquiries to The Editor, *Macworld*, 501 Second St. #600, San Francisco, CA 94107.

S2

Valid through 4/19/88

Circle number 999 to subscribe to *Macworld*. We will bill you $30 for a 1-year (12-issue) subscription (U.S. only).

January 1988

PLACE
FIRST-CLASS
POSTAGE HERE.
(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP)

MACWORLD

Product Information Service
P.O. Box 8260
Boulder, CO 80329-8260

PLACE
FIRST-CLASS
POSTAGE HERE.
(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP)

MACWORLD

Product Information Service
P.O. Box 8260
Boulder, CO 80329-8260

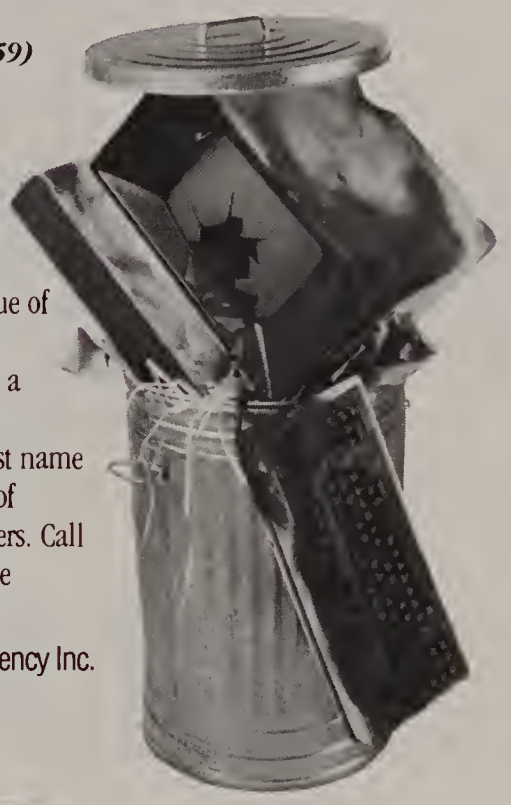
Advertiser Index

Reader Service Number		Reader Service Number	
212	ABA, 231	609	MegaGraphics, 204
18	ABA, 233	352	Micah Storage, 188
622	Abaton Technology Corp., outsert	774	Microlytics, 183
—	Adobe Systems, 80	—	Microsoft, IFC-1, 36-37, 102-103
1	Adobe Systems, 81	470	Microtech Intl., Inc., 243
678	Adobe Systems, 52-53	714	Microtek, 92
227	Altsys, 244	37	Miles Computing, 76
700	Asher Engineering, 212	640	Mitsubishi, 189
797	Ashton-Tate, 22-23	642	Mitsubishi, 191
41	Bantam Books, 229	645	Mitsubishi, 193
490	Bede Tech, 200	779	Moniterm, 47
627	Bering Industries, Inc., 54	397	MSC Technologies, 187
373	Best Computer Supplies, 100	72	Nashoba, 270
20	Bible Research, 42	411	National Data Products, 248
301	Budgetbytes, 189	196	National Semiconductor, 94
795	CDA, 273	559	North Edge Software, 61
757	Casadyware, 84	—	NuData, 181
604	CE Software, 98	718	Open Mac System, 280
581	Check Mark Software, 214	575	Orange Micro, 226
593	Club American Technologies, Inc., 88	775	Palantir, 46
657	CMS Enhancements, 221	144	Peachtree Software, 246
619	CMS Enhancements, 223	413	PerfecTEK, 34
134	Comark/USA Flex, 228	670	PerfecTEK, 186
776	Compatible Systems Corp., 191	223	Personal Computer Peripherals, 13
330	Compuserve, 177	729	Personal Computer Peripherals, 13
271	Computer Friends, 180	560	Personal Training Systems, 44
371	Computer Mail Order, 174-175	242	Positive Works, 86
384	Cricket Software, 6	211	Practical Computer Applications Inc., 33
684	Cricket Software, 184		
616	DCA, 56-57	725	Princeton Graphics, 208
232	Dayna Communications, 72	656	Princeton Graphics, 18-19
621	Deneba, 60	194	Programs Plus, 68-71
606	Design Science Inc., 275	334	Public Domain Exchange, The, 277
615	DEST Corp., 14-15	585	Radius, 79
562	Diskette Connection, 224	577	Radius, 77
498	Dove Computer, 202	632	Resonate, 232
355	Dow Jones Software, 190	693	Safeware, 277
410	Educomp, 182	587	Saltspring Software, 276
612	Epic Technology, Inc., 28	—	Satori Software, 35
676	Ergotron, 87	184	Secure-It, 234
168	EZware Corp., 193	743	Sigma Design, 39
600	E-Machines Inc., 8-9	266	Silicon Beach, 63, 65
628	1st Aid Software, 46	178	Softview, 218
312	Fifth Generation Systems, 198	407	Software Supply, 205
—	GE Information Systems, 64	415	Software Supply, 207
143	General Computer, 74-75	625	Software Ventures, 16
123	Grimes Company, 242	210	Sony Corp., 25
791	GW Instruments, 182	225	Statsoft, 42
272	Icon Review, 48-51	703	Studio Advertising Art, 196
597	Image Club, 38	—	SuperMac, 30, 58, 62, 96
316	Infosphere, 82	704	3Com, 194
249	Infosphere, 82	524	TOPS, 21
592	Inmac, 207	769	TSR, 275
586	In-Focus, 217	398	Telemart/Computer Warehouse, 237
530	I/O Design, 78	96	Think Technology, 7
457	Jasmine Technology, 45	176	Thunderware, 192
641	Jasmine Technology, 43	483	Tussey, 241
605	Jasmine Technology, 239	332	T/Maker, IBC
747	Jasmine Technology, 83	537	Uptime, 5
11	Kensington, BC	591	Value Line, Inc., 59
119	LaCie, 40	48	Varityper, 235
767	Laser Connection, 215	27	Velobind, 206
706	Laser Connection, 213	70	Virginia Systems, 196
720	Laser Connection, 211	439	Warp Nine, 31
598	Letraset, 170-171	231	White Pine Software, 234
278	Letraset, 172	40	Wordperfect, 26-27
—	Living Video Text, 10, 216	110	XOR, 203
—	Mac Expo, 278-279	265	XOR, 199
599	Mac Group, The, 225	68	XOR, 201
—	MacConnection, 146-151	146	XOR, 197
—	MacProducts Marketing, 269		
781	Macromind Inc., 90		
653	Macropac, 85		
206	Mass Micro, 67		
764	Mass Micro, 66		
—	Maxell, 291		

Before this happens, call SAFEWARE

800/848-3469

(In Ohio, call 614/262-0559)



Protects your computer against theft, fire, power surges and other accidental losses. Insures your entire system for as little as $39 a year — depending on the value of your hardware, software, and media. Full replacement after a low $50 deductible.

We're SAFEWARE,® the first name in computer insurance. Tens of thousands of satisfied customers. Call toll-free for rates or immediate coverage.

SAFEWARE, The Insurance Agency Inc.
2929 N. High Street
P.O. Box 02211
Columbus, Ohio 43202

On Compuserve, GO SAF

Circle 693 on reader service card

THE PERFECT $9 GIFT!

- Need a quick gift? We always ship in 24 hours.
- 1-Day air, C.O.D. available
- Public Domain and Shareware



Editor's Choices

Featured in MacWorld Magazine

- ☐ Aug '86 **86** Best of PD.—Communications,utilities,games,DA's **$9**
- ☐ Apr. '87 **106,119** Fun! ScreenWreckers, savers, pranks **$18**
- ☐ Jul. '87 **125** Fkeys Manager, Keystring and selected Fkeys . . **$9**
- ☐ Aug. '87 **132** Saviour, Mac's Headroom, 27 DA's, fonts, demos **$9**

****Four Star Rated in MacUser****

- ☐ **7** Switcher, disk dump **$9**
- ☐ **29** Red Ryder, communications with documentation. (Shareware) **$9**
- ☐ **131** Packit III—2 RAM disks, Hard Disk b/up (512K only) . **$9**

Business
- ☐ **76** PageMaker 1.0—40 templates **$9**
- ☐ **135** Best of Business, Home Finance **$9**
- ☐ **163** Dbases:mail, inventory, (prints) **$9**

CAD/CAM
- ☐ **159** CAD/CAM, Advanced Animation **$9**

Desk Accessories
- ☐ **102** Best DA's—utils, modem, Transfer **$9**
- ☐ **168** Use Fonts, Fkeys, DA's w/o install **$9**

Fonts
- ☐ **90** Boston II—laser qlty on Imgwtr **$9**
- ☐ **133** Beverly Hills—Sharpest, Imgwrtr **$9**

Games
- ☐ **103** Best Games—Billiards, Megaroids **$9**
- ☐ **126** Star Trek with sound & graphics **$9**
- ☐ **129** Float in Zero Gravity, Scarab of RA **$9**
- ☐ **134** "Wheel of Fortune": digitized sounds. **$9**
- ☐ **136** Casino game—Blackjack, slots, etc. . . **$9**

Graphics
- ☐ **116,117** Clipboard Art, Slideshow, more **$18**
- ☐ **151** Artisto—MacPaint-like DA, more . **$9**
- ☐ **161** Talking Head 3-D animation, sound **$9**
- ☐ **178** Movies:Vampires of NY, etc.(512K only) **$9**

Nudes
- ☐ **49,66** Girls! Adults only pictures **$18**

Programming
- ☐ **166** Complete Sesame C compiler **$9**
- ☐ **195** Simple Tools: C language libraries **$9**

Science
- ☐ **154** Earthplot—draw detailed 3D globes **$9**

Sounds
- ☐ **160** TV Startup Sounds, Sound Init **$9**

Utilities
- ☐ **5** Code Cracking w/doc, FEdit **$9**
- ☐ **6,89** ResEdit: edit fonts & icons. **$18**
- ☐ **130** Disk Catalogger—organize disks **$9**
- ☐ **BOOK:** 150 pg directory of disks **$7.95**
- ☐ **1 Yr. Membership:** book, quarterly bulletins, plus many discounts **$20**
- ☐ **Library:** Complete set—195 disks **$975**

SPECIAL OFFER!
Any 5 Disks + Book + Bulletin
***ONLY* $39.95** (+$4 S/H)

Add $4 ($10 foreign) for shipping & handling or $2 ($5 frgn) if ordering book only. CA orders add sales tax.

Enclosed $_____ by ☐ Check ☐ VISA ☐ MC

Card No _____ Exp _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

For free bulletin circle reader service no. 334

THE ◆ PUBLIC ◆ DOMAIN EXCHANGE

CALL NOW!

2074C Walsh Ave., Dept 112 800-331-8125
Santa Clara, CA 95050 In CA 408-496-0624

Circle 334 on reader service card



Sign up for MACWORLD Expo/ San Francisco. And save enough

Head for MACWORLD Expo/ San Francisco January 15-17 Moscone Center. And step on it.

Hail the nearest taxi and roll on over to MACWORLD Expo/San Francisco, the original Macintosh computer show.

Test drive an extraordinary array of hardware, software and peripherals first-hand. Weave in and out of traffic. Stop at hundreds of exhibits. Attend dynamic seminars and workshops run by industry experts. Tune up your Macintosh skills. And more.

In three days, under one roof, you'll pick up tips, tricks, techniques, do's, don'ts, how-to's and what's news that would otherwise take weeks to collect. And if you register before December 15, 1987, you'll save $5. Enough to pay for cab fare.

Keep your hands on the wheel, Mac.

MACWORLD Expo/San Francisco is a hands-on, do-it-yourself show. It's exciting. It's challenging. It's fun. And it's fruitful.

Create professional-quality business graphics — on the spot. Compose your own newsletter, ads and brochures. Try your hand at desktop engineering and design. Send or receive messages from Mac to Mac. Witness the power of the latest Mac programming environments. Do all this and more in just three short days.

There's something for everyone.

It doesn't matter whether you're a seasoned hack or just out for your first drive. After three days, you'll be chock full of information on what Macintosh can help you do. In the office, in the lab, at school or at home.

Our exhibitors list. (As of August 18, 1987.) A who's who of people who design, develop and produce hardware, software and peripherals for Macintosh. 3Com Corp., 5th Generation Software c/o Touchstone, 800 Software, A.L.P. Systems, Inc., Abaton Technology Corp., Acius, Inc., Addison-Wesley Publishing Co., Adobe Systems, Inc., Advanced Computer Graphics, Advanced Elec. Support Prod., Inc., Affinity Microsystems, Ltd., Aldus Corp., ALSoft, Inc., Altsys Corp., Amcodyne, Inc., Americal Group, Anatex, Ann Arbor Softworks, Apple Computer, Inc., Ashton-Tate, AST Research, Inc., Bering Industries, Inc., Berkeley Macintosh Users Grp. (BMUG), Berkeley Systems Design, Blackhole Technology, Inc., Blowhard Industries, Blyth Software, Bogas Productions, Borland International, Boston Computer Society, Broderbund Software, Inc., Byte/McGraw-Hill, C.I. Tech International, Inc., Calcomp, Capilano Computing Systems, Ltd., CasadyWare, Inc., CE Software, Centram Systems West, Inc., Checkmark Software, Inc., CLARIS, CMS, Cognition Technology Corp., CompServCo, Computer Cover Co., Computer Expressions, Computer Friends, Inc., Computer Selection Business Center, Computer Shoppe, Computer Ware, COMTREX, Ltd., Coral Software Corp., Cricket Software, Inc., Datacopy Corp., DataDesk International, DataSpace Corp., DataViz, Inc., Dayna Communications, Inc., DEST Corp., Digital Communications Associates, Dove Computer Corp., Dubl-Click Software, Dynamac Computer Products, Inc., E.I. duPont de Nemours & Co. (Inc.), Eastman Kodak Co. (MPAV KO), EDUCOMP, Ehman Engineering, Erez Anzel Software, Ergotron, Inc., Everex Systems, F.C. Brooks & Co., Farallon Computing, Future Design Software, General Computer Co., Great Plains Software, Great Wave Software, GW Instruments, Hard & Soft, Inc., Hayden Books/Howard W. Sams & Co., Hayes Microcomputer Products, Inc., Heizer Software, Hewlett-Packard Co., High Performance Systems, Inc., I/O Design, Inc., ICOM Simulations, Inc., Icon Review, Imagine Software, Infomax Computers, Infosphere, Inc., InfoWorld, Innovative Data Design, Inc., Internet, Jasmine Computer Systems, Kamar Wood Specialties, Kensington Microware Ltd., Kent Marsh Ltd., Kinetics, Inc., La Cie, Language Systems Corp., Layered, Inc., Letraset U.S.A., Levco, Living Videotext, Inc., LoDOWN, Logic Array, Inc., Logic eXtension Resources, Logical Operations, Lotus Development Corp., Lundeen & Associates, Mac Buyer's Guide/Redgate Comm. Corp., Mac Orchard, Inc., MacMag, MacroMind, Inc., Macropac International, MacTutor, MacUser Magazine/Ziff-Davis Pub. Co., MacWEEK, Magic Software, Inc., Mainstay, Manx Software Systems, Inc., Mass Microsystems, Meta Software Corp., Micah Storage Systems, Micro Dynamics, Ltd., Micro Planning International, MicroGraphics Images Corp., Microsoft Corp., Microtech International, Inc., MicroTimes, Migent, Inc., Mindscape, Inc., Mirror Technologies, Moniterm Corp., Monogram Software, Inc., Monster Cable Co., National Instruments Corp., National Semi-Conductor, New Image Technology, Inc., Nolo Press, NuData, Odesta Corp., Olduvai Software, Inc., Opcode Systems, Orange Micro, Inc., Palantir Software, Para Systems, Paragon Concepts, Inc., PC Telesystems, PC World Communications, Inc., PEAK Systems, Peripherals Computers & Supplies, Inc., Personal Bibliographic Software, Inc., Personal Computer Peripherals Corp., Personal Training Systems, Pixelogic, Inc., Polomor Software, Inc., Postcraft International, Inc., Practical Computer Applications, Inc. (PCAI), Priam, Primera Software, ProVUE Development Corp., Public Domain Exchange, Publishing, Ink, Quark, Inc., Racet Computers, Ltd., Radius, Inc., Ribbon Land, Satori Software, Scott, Foresman and Co., Second Wave, Inc., Select Micro Systems, Sigma Designs, Silicon Beach Software, Inc., SoftView, Software Complement, Software Supply, Solutions, Inc., Spectra Blue, Spectrum Digital Systems, Spectrum Holobyte, Springboard Software,Strawberry Tree Computers, SuperMac Technology, Survivor Software, Ltd., Symmetry Corp., Systat, Inc., Tacklind Design, Inc., Target Software, Inc., TeleRobotics International, Inc., Telesis Educational Systems, Inc., The Bottom Line, The Macneal-Schwendler Corp., The Madson Line, THINK Technologies, Inc., TPS Electronics, True Basic, Versacad Corp., Virginia Systems Software, Vision Technologies, Inc., White Pine Software, Inc., Williams & Macias Microcomputer Products, WordPerfect Corp., Working Software, Inc. And there are more to come! MACWORLD Exposition/San Francisco is the original Macintosh computer show. It's sponsored by MACWORLD, the Macintosh™ Magazine, a member of the IDG Communications/Inc. family.



Francisco by December 15. for cab fare.

There's literally something for everyone — including special programs on computer-aided design, business graphics, communications, desktop publishing, education, programming with Mac and then some.

Taxi, anyone?

Avoid long lines at the door. Register now for this exciting three-day conference. And save $5.

Simply fill out the coupon and send it with your check for $35 (or supply credit card information) to the address listed before December 15, 1987. Onsite conference admission is $40. And no credit cards or checks will be accepted at Moscone Center.

This low $35 fee allows you to visit all exhibits and attend all seminars. If you just want to visit the exhibits, admission is $15, payable only at the door.

To register additional people, just copy this form and complete it for each attendee. For group and student rates, please call 617-329-7466 by December 10. This form must be received by December 15. After that, you must register at the show. All registrations are non-refundable.

Don't miss out on this opportunity to take a free ride. Register now and save $5.



Here's a big tip.
Register by December 15.
And save $5 — enough for cab fare.
After December 15 register at the show.

☐ **Yes.** I want to pre-register for MACWORLD Expo/San Francisco, January 15-17, 1988 at the Moscone Center at $35. **Please send my badge to:**

Name _____

Title _____

Company _____

Mailing Address _____

City _____ State _____ Zip _____ Phone _____

☐ Check enclosed (make payable to MACWORLD Exposition) Amount Enclosed $ _____

☐ MasterCard ☐ Visa ☐ American Express

Account # ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ (Include all numbers)

Expiration Date _____ Signature _____
(Signature necessary to be valid)

MW

Send payment and coupon to MACWORLD Expo, P.O. Box 155, Westwood, Massachusetts 02090. Coupon must arrive at our office no later than Tuesday, December 15. For further information, call Mitch Hall Associates at 617-329-7466.

MACWORLD EXPOSITION SAN FRANCISCO

The MACWORLD Exposition is produced by World Expo Co., and managed by Mitch Hall Associates. MACWORLD Exposition is a registered trademark of World Expo Co., Inc.

MACWORLD Exposition is an independent trade show not affiliated with Apple Computer, Inc. APPLE and the APPLE LOGO are registered trademarks and MAC, MACINTOSH, and MACWORLD are trademarks of Apple Computer, Inc.

QUALITY, NOT COST

Macintosh™ Enhancements from OPEN MAC Enterprises

See us in San Francisco!
Macworld Booth #2439

MASS STORAGE

INTERNAL DRIVES

For Macintosh SE,II

OME 45i- 45 Megabytes **$999.95**

For Macintosh II

OME 100i- 100 Megabytes **$1599.95**

OME 140i- 140 Megabytes **$1999.95**

EXTERNAL DRIVES

OME 45x- 45 Megabytes **$1199.95**

OME 100x- 100 Megabytes- **$1799.95**

OME 140x- 140 Megabytes **$2199.95**

SCSI Mac- SCSI interface for the 512e **$99.95**

ALL OPEN MAC DRIVES INCLUDE:

- ❑ 110/220V Power
- ❑ 28 millesecond average access time
- ❑ ONE YEAR WARRANTY
- ❑ FREE STACKWARE, Microsoft® Excel, and Works Templates by Heizer Software.
- ❑ Utility Software

ALL OPEN MAC EXTERNAL DRIVES INCLUDE:

- ❑ External SCSI Address Switch
- ❑ 2 Extra Switched Power Outlets
- ❑ Power Line Filtering
- ❑ Front Mounted Power Switch

30 DAY MONEY BACK GUARANTEE!

MEMORY

2 YEAR WARRANTY

For Macintosh Plus

RamPlus 2 **$349**
Expands to 2 Megabytes RAM

RamPlus 4 **$849**
Expands to 4 Megabytes RAM

NOTE: The RamPlus series may not be physically compatible with some internal devices.

For Macintosh Plus,SE

Ram II **$599**
Expands to 2.5 Megabytes RAM

Ram IIs **$649**
Expands to 2.5 Megabytes RAM, Surface Mounted

NEW!

Mac II to TV!!
Limited Quantity **$599**

VIDEO

Composite Video for Macintosh, Plus,SE

VA Plus **$99.95** VA SE **$149.95**

VideoEx **$99.95**
Expands your Mac II to 256 Colors

For Macintosh Plus,SE,II

Ram II+II **$999**
Four 1 Megabyte SIMMs (DIP Mount)

Ram II+IIs **$1099**
Four 1 Megabyte SIMMs (Surface Mount)

NOTE: Due to space considerations surface mount is recommended for the Macintosh SE.

VISA/MC/AMEX Accepted

Education & Government Orders Encouraged FAX: 415/686-4244

OPEN MAC Enterprises
415/682-0440

2280 Bates Avenue, Suite J, Concord, CA 94520

Reseller Inquiries Invited

All OPEN MAC products:

- Are manufactured by OPEN MAC Enterprises
- Are User Installable
- Don't Void Manufacturer's Warranty
- Carry a minimum 1 Year Warranty
- Are stocked for rapid shipment
- Are listed at Cash Discount Price.

© 1987 OPEN MAC Enterprises. RamPlus, RamII, RamII+II, VA Plus, VA SE, Reliant 45,100, and 140 are trademarks of Open Mac Enterprises. Microsoft is a registered trademark of Microsoft Corporation. Macintosh, SE, and II are trademarks of Apple Computer Inc

Circle 718 on reader service card

Macworld Directory

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

RATES: Listings are accepted for a three-time consecutive insertion at a rate of $965. We offer a six-time insertion at $1650 that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.

DEADLINE: For copy deadlines and further information please contact Niki Stranz, your Macworld Directory Account Manager, at 415/546-7722 or 800/435-7766 (800/435-7760 in California). Please send copy and prepayment to the Macworld Directory, 501 Second St., San Francisco, CA 94107.

■ *Accessories*

○ *Bags*

Cordura Bag for Mac SE

- Organize Mac components for easy access, w/padded interior compartments.
- Tough Cordura® & resilient foam padding for protection.
- Quality material & carefully crafted construction–guaranteed.
- Ask about our ImageWriter II case.
- Call your local dealer today! For the dealer nearest you, call us or write. Dealer inquiries invited.

West Ridge Designs, 305 N.W. 12th Ave., Portland, OR 97209, 503/248-0053

○ *Cables*

Mac Lock/Mac Cables

Mac Lock, finest security kit for Mac +, Mac SE, Mac II, secures Mac, keyboard, mouse, 2nd drive, modem, & printer. Attractive red vinyl-covered steel 3/16" cables. Lock included. No tools req. $-back guarantee. Also, all IBM, Apple $40. Mac Cables provide any length custom cables for Mac/+ (incl. keyboard) or almost any computer need. $20 & up.

Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/595-4838

○ *Hardware*

MACOPENER™

The finest one-piece tool to open the Macintosh case. Do your own upgrades, installations, adjustments, and repairs. No moving parts. One year warranty, parts and workmanship. Suggested list $19.95 + $3 shipping and handling. Dealer inquiries welcome.

Central Products Corp., 2211 Norfolk #518, Houston, TX 77098, 713/529-1080

Keypad/Trackball

The Numeric Ease: Upgrade your 512K/128K w/a 22 station, full scale, full function numeric keypad. Includes cursor keys & direct function keys, such as +, −, ×, ÷, & =. List: $59. The Numeric Turbo: A track ball cursor controller combined w/numeric Ease. List: $169. Dealer inquiries welcome.

Cambridge Automation, Inc., 20230 State Rd., Cerritos, CA 90701, Orders/Info: 800/345-8666 or 800/826-9214 in CA.

○ *Repro Laser Paper*

LASEREDGE™ Paper/Film

Get high resolution from plain paper laser printers and color plotters. LASEREDGE™ high resolution papers/films are waxable for paste-up. The bright white background, denser image, and finer line edge allows enhanced capability for 300 dpi to reproduce on camera. Call or write for samples today. MC/Visa accepted.

CG Graphic Art Supply, Inc., 481 Washington St., New York, NY 10013, 212/925-5332

○ *Supplies*

LaserWriter Toner Recharge

Don't throw out empty toner cartridges. Sell them to us. Cartridge $6.50, cleaner $3, & box + packing $.50. ● PRINTERS: Apple LaserWriter, HP & more ● COPIERS: Canon PC models ● BUY OUR RECHARGED CARTRIDGES $50, Blu/Brn $70. We supply empty cartridge & felt cleaner. QC test sheet provided. Support available.

Michlin Computer Consultants, Inc., Laser Cartridge Division, 3770 Plaza Dr. #1, Ann Arbor, MI 48108, 313/663-9800

Laser Cartridge Recharge!

$$$Save a lot of money recharging laser-printer toner cartridges for Hewlett-Packard LaserJets, Canon, Apple LaserWriter, Corona, QMS. Recharged cartridges are reconditioned to work like new but last 20% longer. Money-back guarantee. Send $40 per cartridge plus $3 s/h. Monthly discounts.

Toner Technologies/Laser Systems, 7 North Main, P.O. Box 407, Kaysville, UT 84037, 801/544-3090

Recharge Dealerships!!

Hot New Field! Recycle laser printer & copier toner cartridges. Join our network & make money now. Train at our location or at home. High profit, low overhead. Established company. Learn it right–no drill & fill! Factory-like recharge method. Receive tools, supplies, trade secrets, marketing strategy & technical support. Free call for information.

Laser Charge Co., 11782 Jollyville-Rd., Austin, TX 78759, 800/223-8134 or call collect 512/335-8191

■ *Advertising*

○ *Novelties/Premiums*

Create a You-nique® Gift

YOUR logo or artwork on our gifts

● COFFEE MUG	$12.50/6.90*
● MOUSE PAD	$12.50/7.90*
● T- SHIRT	$12.50/5.90*
● CHOCOLATE	$10.50/6.90*
● SWEATSHIRT	$17.50/10.90*
● TRAVEL BAG	$24.50/15.90*
● AWARD PLAQUE	$24.50/17.90*

*72+ price. $3.60 for 144 mugs. Quantity pricing available for larger orders. FREE catalog!

Computer Expressions, 3833 Chestnut St., Philadelphia, PA 19104, 215/222-4400

○ *Mailing Lists*

Macintosh Mailing Lists

Macintosh user names & addresses on adhesive labels, mag tape, or as Mac files on diskettes. Over 133,000 names to choose from. Only 5¢ per name for one-time rental. No charge for selecting, sorting, key coding, media, or delivery. Choose any quantity. This extremely high-quality list is updated daily. Ask for our one-time rental agreement before sending payment.

Semaphore Corp. 207 Granada Dr., Aptos, CA 95003, 408/688-9200

■ Consulting

Custom Developer

Specializing in integrated systems for legal, medical, sales & corporate mgmt. communities. Macros, templates, custom applications developed using *4th Dimension, Document Modeler,™ Project Modeler,™ Red Ryder,™ Excel.™* Nationwide service through our 24 hr. BBS. Fixed price, T&E, or hourly contract negotiable.
Generation IV, 3232 San Mateo NE #199, Albuquerque, NM 87110, 505/765-9666

○ System Configuration

Mac One-Stop Service

We specialize in bundling hardware and software for desktop publishing, LAN, database management & for small business accounting applications. Authorized dealer for Odesta, Dayna, Centram & Mega Graphics. Call for free price list & appointment. Best service & competitive pricing.
Pacific Prime Computer Products, 2612 Artesia Blvd. #B, Redondo Beach, CA 90278, 213/376-5820, 213/871-2112 (FAX)

○ Computer Insurance

Safeware

Insure your computer. Safeware provides full replacement of hardware, media, and purchased software. As little as $39 a year provides comprehensive coverage. With our blanket coverage, no lists of equipment are needed. One phone call does it all! Call 8 a.m. to 10 p.m. EST (Sat. 9 to 5).
Safeware, The Insurance Agency Inc., 2929 N. High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469 (national), 614/262-0559 in Ohio

Data Security Insurance

The"all risk" Personal Computer Policy from DSI includes essential coverage not available with other policies: protection against loss of data (even from accidental erasure), loss of custom programs, & fraud. As low as $35 a year. Coverage can be bound by telephone, 9 to 4 Mountain Time.
Data Security Insurance, 4800 Riverbend Rd., P.O. Box 9003, Boulder, CO 80301, 303/442-0900, 800/822-0901

■ Hardware

○ Accessories

Mac-cessory™

Everex, the leader of PC add-ons has come to the Macintosh market with their EMAC series of hard drives, tape backup units, and modems.
- EMAC- 20D $579
- EMAC- 40D $995
- EMAC- 60T $839

I/O Design presents MacLuggage:
Mac SE carrying case $83.95
MacPlus carrying case $64.95
Valley Computers, 16744 W. Park Circle, Chagrin Falls, OH 44022, 216/543-1952

○ Bar Code

Bar Code/Mag Card Readers

Bar code & mag stripe (credit card) readers for all Macintosh computers, easily connected on the keyboard circuit, requiring no additional program or port; simple but powerful code-39 bar-code printing program for ImageWriter & LaserWriter; magnetic encoder/verifier. GSA pricing avail.
TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833

○ Desktop Presentations

The *Moving* Mac Show!

New Macnifier™ LCD electronic transparency projects any Mac *in action* on largest screens and walls from a regular overhead projector. Easily show any programs or graphics at meetings, classrooms, & trade shows. Liquid quartz for crystal clarity. Models from $1495. Free catalog of exciting Mac video products.
Comtrex Ltd., P.O. Box 1450 El Toro, CA 92630, free catalog 800/443-2751 x140, technical questions 714/855-6600

○ Disk Compatibility

Use Mac Disks on IBM PC

MatchMaker lets you plug any Macintosh external floppy drive into an IBM PC. Half-size card and software lets you copy to/from, view directory, initialize, or delete files on the Mac disk. Works with PCs, XTs, ATs & compatibles. The easy way to move info! $149. Visa/MC/COD/Checks.
Micro Solutions Computer Products, 132 W. Lincoln Hwy., DeKalb, IL 60115, 815/756-3411

Transfer Files to IBM

MatchMaker card fits in PC/XT/AT; transfers any Mac file to IBM and back. Simply plug your external Mac drive and *MatchMaker* into an IBM. $139 + $3 s/h.
MatchPoint card fits in PC/XT/AT; transfers Apple DOS, SOS, CP/M and ProDOS files to IBM and back. The IBM must have 5¼" 360K drive. $185 + $3 s/h.
Blue Heron, 1108 S. Second St., DeKalb, IL 60115, 815/758- 2355

○ Hard Disk/SCSI

YOUR MAC SOURCE

For all your Mac needs from hard disk drives, software, peripherals, Mac cases, books, networking and consulting. Desktop publishing typesetting and graphic design. Manuals, catalogs, newsletters, & brochures. Call us today!
Your Mac Source, 5600 Roswell Prodo North, #264, Atlanta, GA 30342,404/843-2267, 800/367-7552

○ Lisa/Mac XL

NEW! Lisa/XL 800K Drives!

Dafax provides full service & support for your Lisa/Mac XL. We carry a full line of upgrades, replacement parts & peripherals, including HFS, 20MB replacement hard disks for *all Lisas & XLs,* RAM upgrades & more. For latest new product information call our toll-free hotline 800/782-7823.
Dafax Processing Corp., 14 North Drive, Malba, NY 11357, 800/323-1751 (orders & info.), 215/574-0357 (PA)

○ Memory Upgrade

Memory Enhancements

Upgrade your Mac to 512K, 1024K, or 2048K of contiguous memory. SCSI port & fans available. Factory flow-solder techniques used for high reliability. 120-day warranty. Local 20-minute installation or mail order. Dealer inquiries welcome. Call for pricing and information.
Ehman Engineering, 115 Apache Dr., Evanston, WY 82930, 800/257-1666

SIMM MODULES

• Bring your PLUS, SE & Mac II up to max memory. These SIMMS utilize surface mt. technology as chosen by Apple. • Specs: 1M DRAMS are 120NS, CMOS components selected for cooler operation & greater reliability.
• Also available 256K SIMMS & video RAM upgrades.
• All products unconditionally guaranteed.
• All inquiries welcome
CDC Enterprise, 2883 E. LaPalma, Anaheim, CA 92806, 714/630-4633

ONE MEGABYTE SIMMS

Upgrade your Mac Plus, Mac SE, or Mac II by 2 Megabytes for $575. These SIMM modules are the newest state-of-the-art plug-ins for Macs listed above. Low power eliminates the need for cooling devices. Using surface-mount technology these units should fit most future models for many years. We offer a limited lifetime guarantee against mfg. defects. (Dealers welcome.) Visa/MC accepted.
D.M.S. (Data Memory Systems), Box 785, Middleton, MA 01949, 617/683- 2325

RAM/ROM Upgrades

- 128K to 512KE
- 128K to Mac Plus
- 512K to Mac Plus

All upgrades incl. new Apple ROM/Drive. Free internal Macintosh fan.
• Mac pkg. deal:
1 used Mac Plus w/internal fan, Seikosha printer, Ehman 800K drive, 6- outlet power strip, disk holder & software $1700.
• Seikosha printer works w/any Mac & comes w/2-yr. warranty. $250.
Disk Luggage, 5526 Pemberton St., Philadelphia, PA 19143, 215/471-9242 (until 10 pm)

PSI MAC PAC

$199 is all it costs for a 1MB memory upgrade for your MacPlus, SE or II. These surface mount, CMOS DRAMs use little power and eliminate the need for cooling devices.

1M SIMM	$229
256K SIMM	$57.25 ea.
2 × 1M SIMM	$448
4 × 1M SIMM	$859

Dealer inquiries welcome. MC/Visa. For more info. call:
PSI, 1609A S. Main St., San Jose, CA 95035, 408/942-8188, 800/MAC-1PAC

One Megabyte SIMMS

Upgrade your Mac Plus, SE, or Mac II by 2- to 4MB for $280 per meg with ACCUSIMMS, newest state-of-the-art CMOS surface-mount DRAMS, with lifetime guarantee. Assembled & tested in the USA. Quantities of 20 or more pcs. $225 ea. MC/Visa accepted freight prepaid.
Data Memory Systems, Box 785, Middleton, MA 01949, orders only 800/634-5463 ext. 320, customer service 617/683-2325

○ *Networking*

PhoneNET® System

The PhoneNET System creates an AppleTalk network w/convenience, added distance, & flexibility of telephone wire. PhoneNET supports AppleTalk & can use standard telephone cabling, even existing wiring. Components incl: PhoneNET PLUS Connectors, PhoneNET StarController w/StarCommand DA & PhoneNET Manager software, TrafficWatch network analysis package & PhoneNET CheckNET DA.
Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704, 415/849- 2331

CompuNet Connector

LOW COST-HIGH QUALITY AppleTalk PhoneNet™ compatible network connector. Uses standard telephone wire. No special hardware required for 3000 ft. AppleTalk networks. $24.95 retail. SCSI Cables 25-50 & 50-50 UL. $24.95 retail. Dealer inquiries welcome.
Trimar USA Inc., 236 W. 15th St., New York, NY 10011, 800/872-4454, 212/645-7008

Ethernet for the Mac

Kinetics provides Ethernet hardware and software for all Macintosh computers. These products include:
- FastPath: An AppleTalk- Ethernet gateway
- EtherSC: A SCSI-Ethernet controller
- EtherPort SE: An internal Ethernet option card for the Macintosh SE

AppleTalk and TCP/IP software is supported.
Kinetics, Inc., 2500 Camino Diablo, Walnut Creek, CA 94596, 415/947-0998

○ *Sound*

MacRecorder™

MacRecorder records *real* sound into your Mac. Simple to use. Hold it in your hand & speak into the built-in microphone, or record directly from your TV or stereo. Package incl.: *HyperSound*™ stackware lets you record & work w/sound from within HyperCard. *AudioFile*™ records sound, then lets you edit & save file in a variety of formats including *HyperCard,*™ *StudioSession,*™ *VideoWorks*™ & *Beep INITs.*
Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704, 415/849-2331

○ *Video*

MacMonitors/Projectors

- Does your Mac need to be seen in the boardroom, classroom, trade show midway? Big-screen (17″ to 23″), high res color or monochrome w/anti-glare & vari scan, from $1,095.
- Projector systems for the ultimate in Mac-impact,from $3,895. • Rental MacMonitors & projectors avail.
- Dealer inquiries welcome.

National Television Systems Co., 2113 Wells Branch Parkway, Suite 6100, Austin, TX78728, 512/251-1392, 800/777-3000

■ *MIDI*

Call 1/800/FOR MIDI

MIDI for everyone! Start your computer/MIDI system today with discount prices & expert help from FUTURE MUSIC. You don't have to be a PRO—most of our customers are just "plain folks" with a home computer and a love of music. Call for FREE CATALOG of Hardware, Software, Synthesizers, 4-tracks and more. All major brands avail.
Future Music Inc., 900 W. First St., P.O. Box 1090, Reno, NV 89504, 702/826-6434

■ *Publications*

○ *Catalogs*

DESKTOP CATALOG™

Profit-making products for desktop designers in publishing, presentations, and graphic design. You've paid for the system—now make it perform! We sell the products desktop designers need. For your free catalog, write:
Desktop Catalog,™ Customer Service, P.O. Box 7336-b, Boise, ID 83707

■ *Services*

○ *Data Conversion*

Tape/Disk Conversions

Conversion services for your Macintosh, to or from over 800 computer systems:
- Mag tapes
- Microcomputers
- Word Processors
- Typesetters

Our conversion capabilities include to or from 3½-inch, 5¼- inch, and 8-inch disks & mag tapes.
Pivar Computing Services, Inc., 165 Arlington Heights Rd., Dept MC, Buffalo Grove, IL 60089, 312/459-6010

○ *Desktop Publishing*

MacTypeNet™

Mac/PC typesetting. Disk or modem. 300-dot LaserWriter™ output; 635-, 1270-, or 2540-line Linotype™ L300P output. Composition, page makeup, printing/bindery services. Hardware/software sales, services, and support; beginning and advanced training and seminars for Macintosh, PC, and Linotype 100/300 users.
MacTypeNet,™ P.O. Box 52188, Livonia, MI 48152-0188, 313/477-2733

Laser Printing Services

LaserWriter (300-dpi)/Linotype L100 (1270-dpi) output of your Mac/IBM files. Disk or modem. 24 hr. service. Linotype $5 per page ($3.50 volume discount). LaserWriter $.50 per pg. Desktop publishing specialists in consulting & design services. Hardware/software sales. Xerox Ventura Publisher for sale at low price. Full offset printing & bindery services available.
Laser Printing Services, 26058 W. 12-Mile Rd., Southfield, MI 48034, 313/356-1004 (MI), 800/722- 3475 (nat'l) Modem: 313/356- 3186

Laser Typesetting

Professional-quality file output service at competitive prices. Mac or IBM, via disk or modem to our LaserWriter or Linotype. Same-day service. We can also keyboard your copy, from a letterhead to a full-length novel. Also available: complete darkroom services and platemaking for your printer. Write or call toll free:
Hodgins Engraving, Box 597, Batavia, NY 14020, 800/354-6500 (Nat.) or 800/626-8900 (NY)

Type/Imagesetting

Island Color Productions has so many advantages:
- High-resolution typsetting
- Linotronic imagesetting • Laser printing • Computer graphics & design • Speedy turnaround time
- From MAC, IBM or any ASCII file
- Whether keyboard, disk, or modem

Why not take advantage of us?
Island Color Productions, 11 Stony Brook Ave., Stony Brook, NY 11790, 516/751-0485 (voice), 516/751- 0430 (24-hr. modem on line)

○ *Graphics*

NYC, Phila., NJ Designers

Desktop publishing doesn't have to look cheap! IBM or Mac files, disk or 24-hr. modem, for high-resolution L300 output through award-winning color printing, binding, & mailing. Impartial system advice, in-depth training, & support for major DTP Mac & IBM pkgs. +PostScript itself. Messenger service! Ask for Kay Downs.
Waldman Graphics, 9100 Pennsauken Hwy., Pennsauken, NJ 08110, 212/925-2420, 215/627-7200, 201/522-8778, 609/662-9111

West Coast Connection!

Upload by disk or 24-hr. modem for 2540-line L300 output, with up to 30 font calls per page. Support all Adobe fonts, Mac & PC software including Ventura, Pagemaker, and most PC word processors. 24-hr. turnaround. Adobe type dealer; beginning and advanced training for Mac, L300 and PC users. Convention service.
Lazer Graphix, 314 Las Vegas Blvd., Las Vegas, NV 89101, 800/492-0020, 702/386-2626 (Voice), 702/384-6761 (Fax). (24 hr. modem on line)

○ *On-Line Info Service*

Telefolders

Telefolders is a national electronic information service for Mac users only. Our software lets your Mac & any speed modem access our public data base using only standard icons, windows, & pull-down menus. Browse, upload and download, with just a click of the mouse. No commands to learn, no typing to do. Over one-year old. $49.95 gets you a complete starter kit, access time included.
Semaphore Corp., 207 Granada Dr., Aptos, CA 95003, 408/688- 9200

○ *Typesetting*

Command Typographer®

MAC TYPOGRAPHY. Macintosh/*Quality* Typesetting. *Command Typographer*® features were on minis & mains. *Sophisticated* multipass H&J provides kerning, formats, tabs, vertical justification, micro justification, automatic leader, letter spacing. $495. Save $, copy disk/modem, high-res. typesetting/24 hrs. Typesetting avail.
Regional Typographers/The Software Shop, 229 Bedford Ave., Bellmore, New York 11710, 516/785-4422

Linotronic 300 Service

We are your one-stop service for high- resolution laser typesetting. Open 24 hrs., we offer 1-day turnaround, a 24-hr. modem service, and support for all *Adobe* fonts and programs. Unprecedented customer support and extremely competitive prices.
Ad Graphics, 1350 Ave. of the Americas, New York, NY 10019, 212/245- 7300 X133/X259 (NY), 215/386- 2208 (PA), 212/582-9174 (modem)

■ *Software*

○ *Accounting*

Payroll-MultiLedger

● CheckMark *Payroll* calculates all employer and employee taxes. Prints checks and W-2s. Modifiable tax tables. ● *MultiLedger* consists of accounts payable, accounts receivable, general ledger, and inventory. Allows profit centers, budgeting, & previous year comparisons. ● 60-day money back guarantee. Demos $15 each.
CheckMark Software, Inc., 1520 E. Mulberry, #230, P.O. Box 860, Fort Collins, CO 80522, 800/426-2466 ext. 338

Grant Cost Accounting

GRANT MANAGER is an accounting program for grants and other research funds. It tracks expenses by grant/cost code, maintains vendor catalogs, and prints orders on your requisition forms. Reconciler balances accounts with university ledgers. Prints vendor history, monthly expense summary, etc. $425.
Niles & Associates, 2200 Powell St., 765M, Emeryville, CA 94608, 415/655-6666

BAKERForms®

Accounting applications for *Microsoft Works®*. Prints checks, invoices & POs on pre-printed forms. 15 reports give you necessary totals to post to your general ledger. Accounts Receivable, Accounts Payable, Payroll, & Purchasing at $49.95 ea. All 4 at $169.
Baker Graphics, P.O. Box G 826/ Dept. B, New Bedford, MA 02742, 617/996-6732

Business Accounting

Customize or compromise! S.B.A. Small Business Accounting™ is an integrated, do-it-yourself *Omnis 3 Plus* application for: receivables, payables, invoicing, purchase orders, inventory, vendors, customers, commissions, and much more. Multi-user. Unlocked & ready to customize. Call for more info.
Working Computer, P.O. Box 86602, San Diego, CA 92138, 619/483-1453

○ *Apple Emulator*

II in a Mac™ new Version

2.5RUN Apple II software on a Mac and still use desk accessories & Cut & Paste to Clipboard. Transfer Apple II disks to the Mac by cable or phone. Use UniDisk directly w/Mac drives. CONVERT *Appleworks* or any other Apple II data file into standard Mac textfiles. DEVELOP software using Apple II BASIC & ML. Full 65C02 debugging system built in.
NOT COPY PROTECTED.....$149.95
Computer:applications Inc., 12813 Lindley Dr., Raleigh, NC 27614, 919/846-1411

○ *Artificial Intelligence*

Instant Expert™

A simple and powerful *Expert System Shell* designed to be the easiest to use. The powerful inference engine provides an easy-to-use expert system application query. Forward and backward chaining as well as a unique mixed strategy gives real flexibility to users. The system can explain *how* and *why* a conclusion was reached and give the user special *Solution* information. $198.
Human Intellect Systems, 1670 S. Amphlett Blvd., San Mateo, CA 94402, 415/571-5939

○ *Astrology*

Graphic Astrology

Accurate, easy-to-use GA calculates, displays & prints charts and other data. Basic $39.50. Advanced $129.50. Introducing the Gamma Version for $199.50. Faster, uses more of Mac Toolbox, Multiple Windows, more options & documents. Converts to *MacPaint*. Support Laser & Mac II. Visa/MC OK. Info. upon request.
Time Cycles Research, 27 Dimmock Rd., Waterford, CT, 06385, 203/444- 6641

○ *Authorship*

NEW-Course Builder™

Go from concept to code with no middleman. Create stand-alone applications with user input, graphics, animation, and sound. This visual language provides a next-generation development environment. Programming is as easy as drawing a flowchart of your thoughts. Send for a brochure, demo on *CompuServ.* $395.
TeleRobotics™ International, Inc., 8410 Oak Ridge Hwy., Knoxville, TN 37931, 615/690- 5600

○ *Backup/Restore*

HFS Backup™

Back up (archive) data from your hard disk. Back up/restore the entire disk, selective files, or changes only. Includes/excludes files based on name, class, or data modified. Creates backup templates, saves/prints file list (hierarchically by folder or alphabetically by file) $49.95. (*Appleshare version avail.* $149.) MC/Visa or at your dealer.
Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, FL 33634, 813/884-3092, 800/622-2888

○ *Billing*

Automated time-tracking!

TimeMinder™ is an automatic time-billing/productivity analysis program and desk accessory. Operates in the background to eliminate manual timelogs. Also allows for manual entry of time. Includes a variety of search, sort, and printing capabilities. You can describe ea. work session with a 7650 character note. Introductory price $139.
Aatrix Software,™ P.O. Box 5359, Grand Forks, ND 58206, 701/746- 7202

○ *Business Mgmt.*

Advertising Agencies

Clients & Profits™ is a complete job planning, costing, and billing system designed by advertising professionals for advertising agencies. Features estimates, scheduling, client tracking, time sheets, payables, receivables, and more. Multiuser. Customizable too! Satisfaction guaranteed.
Working Computer, P.O. Box 86602, San Diego, CA 92138, 619/483-1453

TimeMinder™

is an automatic time billing/productivity tracking program and D/A. It operates in the background, using the clock to eliminate manual timelogs. Fully featured. Allows for manual entry of time, attachment of 255 character note. Includes PauseTime D/A. Price: $139.
Aatrix Software,™ P.O. Box 217 A, Grand Forks, ND 58206, 701/746-7202

○ *Business Planning*

Excel Business Toolkits

● *Develop Your Business Plan:* 200-pg. workbook, 21 tables, 16 graphs,complete instructions: $69.95 ● *Financial Forecasting:* Workbook, sample pro-forma models, macros, graphs, instructions: $49.95 ● *Sales and Market Forecasting:* Workbook, sample models, macros, graphs, where to find information: $49.95
Infoplan, Inc., 155 Forest Ave., Palo Alto, CA 94301, 415/325-3190

○ *Case Tools*

ER Database Design Tool

ERVision is a database design tool using Entity-Relationship diagrams. Complex diagrams can be hierarchically organized with links between levels shown in each window. Provides diagram layout, design reports, and ER design checks. One year of updates. $150. Visa or PO.
Andyne Computing Limited, 544 Princess St. #202, Kingston, Ontario, Canada K7L 1C7, 613/548-4355

○ *ClipArt*

MAC-ART LIBRARY

Illustrate your ideas w/ *MAC-ART LIBRARY!* 12 disks of professional *MacPaint* images:

- Animals
- Farm Life
- Geography
- Kitchen
- Sports
- Tools
- Buildings
- Flowers/Trees/ Plants
- Greeting Cards
- People
- Transportation
- Signs/Symbols/ Borders

Sgl. disks $39.95. Full library $250. Sampler $49.95. $3 s/h. Other disks.
CompuCRAFT, P.O. Box 3155, Englewood, CO 80155, 303/791-2077

Interesting Graphics

Our skilled illustrator has produced 5 collections for your Mac: *Horror/Fantasy #1, Bytes of Fright, Dinosaur Bytes* (natural history), *Sky Bytes* (aerospace), and *Classic Sci Fi*. The collections contain a variety of images, each of which is carefully crafted. Each collection is $29.95 ($32.05 in CA).
AAH Computer Graphics Productions, Box 4508, Santa Clara, CA 95054, 408/980-7363

ARTWARE Graphics Library
Detailed commercial & presentation graphics created with *Adobe Illustrator.* Use with programs that import Encap. Postscript files. Pictorial index included. Use as is, or modify with *Illustrator,* $69.95 per disk. By subscription $49.95 per disk. Disk of the month club.
Artware Systems Inc., 3741 Benson Dr., Raleigh, NC 27609, 919/872-6511, 800/426-3858

Judaic Clip Art
DavkaGraphics–91 Jewish symbols and pictures. Also contains Hebrew fonts for MacPaint and FullPaint. $34.95. *DavkaGraphics II* All-new set of Judaic clip art. $34.95. To order, call toll free 800/621-8227. Major credit cards accepted. For FREE catalog of Hebrew/Judaic software for Mac, call or write:
Davka Corporation, 845 North Michigan Ave., Ste. 843, Chicago, IL 60601, 312/944-4070.

NEW-Clip Art with IMPACT
Introducing IMAGES WITH IMAPCT.™ Graphics that help you design pages. • PostScript created w/Adobe Illustator. • Illustrated how-to's help you maximize layout options for each graphic. • Requires EPSF-compatible program (i.e. *PageMaker*). • *Graphics & Symbols Vol. 1*–Intro. offer (thru 2/28/88 $75 ($81 for WA res.) + $3 s/h. Chk/MC/Visa. Brochure avail.
3G Graphics, 11410 N.E. 124th St. #6155-A, Kirkland, WA 98034, 206/823-8198

○ *Communications*

Mac2624: HP CRT Emulator
Lets your Mac emulate the HP2624, HP2392, and HP2394, reliably running all HP3000 software. Implements HP modes, parameters, keyboard features, and display characteristics within the Mac's mouse/menu/⌘-key environment. Ultrafast file transfer (with text and graphics conversion options) included $199.
Tymlabs Corp., 211 E. Seventh St., Austin, TX 78701, 512/478- 0611, Telex 755820

pcLINK™
A complete Macintosh interconnect solution for VAX (VMS and ULTRIX) and UNIX systems. Provides terminal emulation (VT241, VT220, VT100), file-transfer, virtual-disk, and print-server functionality. Supports serial line, remote modem, AppleTalk, Ethernet, or Omninet communications media.
Pacer Software, Inc., 7911 Herschel Ave., #402, La Jolla, CA 92037, 619/454-0565

Contact™
Burroughs emulation. *Contact* software emulates TD/MT/ET terminals. Sophisticated data capture–all screen data can be used by spreadsheet, database, word processor-...CANDE & XMODEM file transfer. Fully *à la Mac* interface. Soft keys, multiple pages & addresses, password protection...Soon: full file-transfer capabilities, Sperry terminal emulation.
Avenue Software, Inc., 1173 W. Charest Blvd., Quebec, QC, Canada G1N 2C9, 418/682-3088

○ *Custom Programs*

4D™ & HyperCard
• MacSolutions Invoices™ is point-of-sale invoicing software for small business • Lenders Construction Services™ is software for construction lenders & contractors for job costing & analysis • Plant Encyclopedia™ is stackware for nurseries & landscape architects. Demos available. Also CMS & DataFrame HD's from $599 & $749. Visa/MC.
MacSolutions, 241 12th St., Del Mar, CA 92014, 619/481-0479

○ *Database Mgmt.*

DB Master® for the Mac
Special introductory offer: $59.95. Easy to learn and use. Database manager ideal for first-time user. Store, organize, retrieve & print info. High capacity, powerful, flexible, not copy protected. 30-day $-back guarantee. Call now or send check/MO/Visa/MC $59.95 + $5 s/h to:
Stone Edge Technologies, Inc., P.O. Box 200, Maple Glen, PA 19002, 215/641-1825

Instant Data Access
QuickDEX, a free-form database Desk Accessory with autodialer and printing utility. "QuickDEX is the quickets & easiest solution we have found for storing & retrieving simple information."–*MacWeek.* "The speed is truly amazing."–*L.A. Times.* "I use it all the time."–Steve Brecher/Publisher of *Suitcase.*
Greene, Inc., 15 Via Chualar, Monterey, CA 93940, 408/375-0910 Orders 800/331-4321, 800/851-1986 (CA)

○ *Data Acquisition*

MacPacq
The MacPacq transforms the Macintosh into a digitial oscilloscope, chart recorder & waveform generator. A complete data acquisition & control system. 8 channel A/D, 8 digital I/O, programmable gain, 64K RAM. Optically isolated, line or nicad powered. Runs remote and/or connected to Mac. Comprehensive software interface provides for powerful & flexible system. $995 complete.
Biopac Systems, 42 Aero Camino #215, Goleta, CA 93117, 805/968-8880

○ *Desktop Engineering*

Parameter Manager Plus™
Designed for people who need to manage, analyze & graph time, date, or sample-based data. No macros or templates are needed to produce trend plots, strip charts, histograms, forecasts, parametric plots, statistics, correlation, and financial high-low charts. Plot up to 32,000 data points, 96" x 48" in size. Text import & "Calculated Parameters" $395. Complete Demo $10. MC/Visa.
Rebus Development Corp., 651 River Oaks Parkway, San Jose, CA 95134, 408/263-2207. Orders 800/654-5147, 800/247-4994 (CA)

○ *Desktop Presentations*

Color 35mm Slides
Carousel Color Slide Software™ lets you create 256-color 35mm slides from *MacDraw* files. Use graphics from many other *MacDraw* compatible programs. Transfer slide files by modem to a professional imaging center. 2K resolution slides only $7 each. Slides in 24hrs-free delivery. Call for free samples.
20/20 Data Systems, 7000 Cameron Rd., Austin, TX 512/454- 2508

○ *Desktop Publishing*

Interactive PostScript
Program Postscript™ interactively over AppleTalk using the PostHaste™ integrated programming environment. Full-featured editor, separate error-message capture window, & fast uploader with no file size limit. Great for the beginner, essential for the serious PostScript programmer! $59.95.
Micro Dynamics, Ltd., Dept. W, 8555 Sixteenth St., #802, Silver Spring, MD 20910, 800/634- 7638 or 301/589-6300

MacPalette
by Microspot prints multicolored graphics & text from most Macintosh software using the Imagewriter II. MacPalette will colorprint documents from *MacDraw, MacDraft, MiniCad, MacProject, MacWrite, JAZZ, Microsoft Chart, Word, Excel* etc. (not *MacPaint.*) It prints black as a true black instead of mixing a black. $69.
CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

QUED/M* Macro Editor
Powerful text editor/database manager. Many convenience editing features: e.g., unlimited undos. Find files with key words, find/replace with wildcard characters, type or record macros, count lines, words, sentences, etc., extract any data from text files. Search through unopened files, etc. $119.
Paragon Concepts, Inc., 4954 Sun Valley Rd., Del Mar, CA 92014, 619/481- 1477, 800/922-2993 (Nat'l.)

○ *Educational*

Gradebook/Test Generator
MICROGRADE–flexible course & grading, 400 students/100 assignments per class, prints stats & various reports. Ideal for any grade level. MICROTEST II–create, update, generate, & store exam materials. Easy question entry, large database, multiple test versions. Demo $5. FREE EDUCATIONAL CATALOG.
Chariot Software Group, 3659 India St. #MD1, San Diego, CA 92103, 619/298-0202

Brainchild Grade™
Unique graphic interface, like paper grade book, extremely easy to use. Total integration of spreadsheet, database, & report-generating software. Free-form class structure, enormous capacity, & speed! Complete stats & graph program. Intricately detailed user's manual. Value-priced at $25. No other program comes close!
Brainchild Corp., avail. through the Kinko's Academic Courseware Exchange. To order, call 800/235-6919, 800/292-6640 in California

Best Testing System!
LXR•TEST brings desktop publishing to test generation! Combining graphics, word processing, and database management; LXR•TEST enables you to produce tests easier and better than ever–*We guarantee it!* See why LXR•TEST has been proclaimed the "best educational testing tool on the market!"
Logic eXtension Resources, 9651- C Business Center Dr., Rancho Cucamonga, CA 91730-4537, 714/980-0046

MacKids™
The Learning Edge

Alphabetizer	Lemonade Stand
Naval Battle	ClockWorks
BodyWorks	WordSearch
CoinWorks	FlashWorks
Preschool 1	Preschool 2

Early Elementary 1 EarthWorks
Each title $39.95 MC/Visa/Chk. Write or call for a free catalog.
Nordic Software, Inc. 3939 North 48th St., Lincoln, NE 68504, 800/228-0417, 402/466-6502

MacANATOMY
A complete electronic atlas of human anatomy in *MacPaint* document form. The drawings may be modified and merged into *MacWrite* documents using the Clipboard. Comprised of four volumes, available singly or as a collection.
MacMedic Publications, Inc., 5805 Westheimer, Houston, TX 77057, 713/977-2655

Kieran
Integrated learning program for children 2-6 yrs. Uses child's name in speech and pictures. Totally mouse driven interactive program with iconic interface. Covers alphabet training, time telling, counting skills, upper-lower case, and mystery door! 4-mice rating in *MacUser.* Great gift! MC/Visa $39.95.
Ohm Software, 163 Richard Dr., Tiverton, RI 02878, 401/253-9354

Children's Programs
Exceptional graphics, multiple activities & difficulty levels.
- *Macrobots* (to 5 yrs.) $49.95
- *Animal Kingdom* (6- 10) Science & language arts $49.95
- *Read-A-Rama* (5-9) 2 disks of reading programs $59.95
- *Math Wizard* (5-12) 4 games $49.95
- *Fraction Action* (8 & up) Talking arcade game & tutorial $49.95
- *Decimal Dungeon* (9 & up) $49.95
- MC/Visa/AE–free catalog

Unicorn Software Co., 2950 E., Flamingo Rd. Ste. B, Las Vegas, NV 89121 702/737-8862

Algebra Homework Tutor
Revolutionary HomeworkTutor™ lets you do your Algebra homework or classwork on a Mac. Checks each step you enter, gives hints, poses practice problems, solves and explains examples, and prints completed homework. Easy editing, standard Mac interface, and too much more to tell. Send for free brochure.
Missing Link Software, Box 3280, South Amboy, NJ 08879, 201/721-2569

Flash&Match FLASHCARDS
- Create and learn facts from topics like language, chemistry (sub/superscripts), math. • You select practice/testing methods. • Save test data for any number of people. • Fun animations reward kids–you can change them! $49.95 (+CA 6½% tax) includes 1 year current events databases. Call for info. Visa/MC.

InVenture, Inc., 555 DeHaro #330, San Francicso, CA 94107, 415/626-9986, 800/622-9986

○ *Engineering*

Digital Logic Design Aid
LogiWorks is an interactive digital logic drawing & simulation package for the Macintosh. Features:
- built-in library of common gates, flip-flops, etc.
- user-defined devices, PROMs & PLAs
- adjustable device delays
- 3-state & open-collector devices
- produces timing diagram of selected signals • $159.95 (U.S.)
- Pkg. incl. 7400, analog libraries, & net list utility $199.95

Capilano Computing, 300-1120 Hamilton St., Vancouver, B.C., Canada, V6B 252 604/669-6343

Civil & Structural
Fully integrated analysis programs for 2-D frames, trusses, beams: FRAME MAC, BEAM MAC, BEAM MAC II. Structure, moment, defl. diagrams, text & more. $145-$595. Demo available. New: MacCOGO for geometric & structural properties of shapes: $145. COGO MAC available 1/88 (traditional COGO). $-back guarantee.
Compuneering, Inc., 113 McCabe Crescent, Thornhill, Ontario L4J 2S6, Canada, 416/738-4601

Graphics File Translator
Save time, save money. Don't scan, Don't redraw. Translate between DAF, IGES, MiniCAD, MacDraw, PICT and MS/pal on the Macintosh. Clipboard features takes graphics from engineering/archicture to desktop publishing. $795.
Kandu Software Corp., P.O. Box 10102, Arlington, VA 22210-1102, 703/532- 0213

Microprocessor Devlpmt.
Macintosh-based absolute cross-assemblers & editor for MPUs:
- 6800/01/02/03/08/6301/6303
- 6804/HC04 • 8048/C48/49/50
- 6805/HC05 • 8051/C51/52
- 6809/6309 • 6502/CO2/C00
- 68HC11 • 1802/05 • Z8
- COP400 Fast. Macros & conditional ass'y. supported. Generates S/Hex records. US $99.95 ea. (specify MPU series) + $4 s/h. Call/write for literature. MC/Visa Check/COD.

Micro Dialects, Inc., Dept. MW, P.O. Box 30014, Cincinnati, OH 45230, 513/271-9100

Continuous Beam Analysis
W or w/o overhang at one or both ends. 23 prgs. for concentrated loads & 23 prgs. for distributed loads (lb./ft.). 3 loads/2 supports consecutively thru 25 lds/24 sup. Easy to use–click the icon for number of loads & go. Runtime-interpreter 25 lds/24 sup or compiled 23 lds/22 sup. $280 either. Mac Plus & external dd drive req'd.
Joe Mcgee Consulting Engineer (Regis. P.E.), 1401 NW 105 Terrance, Oklahoma City, OK 73114, 405/751- 4275

End the Nightmare
FaceIt™ provides your programs with rapid access to DAs, file handling, text editing, picture handling, dialogs, printing and more. Consists of stand-alone CODE resources which can be put in any file and used by programs created with BASIC, C, FORTRAN, Pascal, and other compilers. $50 complete.
FaceWare, 1310 N. Broadway, Urbana, IL 61801, 217/328-5842

Plane Frame Structures
LBeam™ is an interactive linear-analysis program for 2-D frame structures. It includes:
- Pinned & fixed beam elements
- Variable node fixity & springs
- Concentrated & uniform loads
- Geometry, load, displacement plots • Element forces & stresses
- Data organization for projects.

Only $149.95 US.
Cognitive Computing, Inc., Vancouver Software Centre, 300-1190 Melville St., Vancouver, BC V6E 3W1, Canada, 604/669- 9800

○ *Entertainment*

Tired of Arcade Games?
Now–9 real simulations: Rommel's DESERT WAR • MIDWAY or THE SOLOMONS (carrier actions) • BARBARIAN in Rome's West or EAGLES in the East • WESTERN CAMPAIGNS or ARMY OF NORTHERN VIRGINIA (Civil War) • NORWEGIAN SEA or U.S. invasion in RED STARS (US/Soviet clashes). Great for solitaire. $34.95 ea. game or $64.95 for 2. Req. 512K+.
SJP Enterprises, P.O. Box 246, McHenry, IL 60050

Tactical Jet Fighter™
An exciting fast frame rate combat 3D supersonic flight simulator for the Mac™ SE, Plus, E, 512K and 128K. 16 scenarios with air-to-air missiles, cannon, air-to-ground rocket salvos and bombs. Easy to play, with on-screen pause and help. List price $44.95. At computer and software stores everywhere.
Electronic Systems & Software Corp., 199 N. El Camino Real #F-208, Encinitas, CA 92024, 619/942-0823

○ *Financial*

MacMoney™
Gain control of your finances with our award-winning record keeper & financial planner designed for the Macintosh™ with your needs in mind. Easy transaction entry. Print checks, many reports, & graphs. Transfer data to a text file for extra benefits from other programs such as *MacInTax.*™ New version 3.0 available Jan. 1st for $119.95 + s/h. Req. 512K.
Survivor Software Ltd., 11222 La Cienega Blvd., #450, Inglewood, CA 90304, 213/410-9527

○ *Fonts*

Downloadable Laser Fonts
Specialized fonts for the LaserWriter. Classical Greek $85. Serif/sans serif for scientific texts $75. Font of 100 chemical structures $125 (with scientific text fonts $160). Polish serif or sans serif $85 each (4 styles). Serif small caps $40. Regular or Polish (4 styles). Modern Greek $85. MC/Visa. As mentioned in Feb. '87 issue.
Allotype Typographics, 1600 Packard Rd. #5, Ann Arbor, MI 48104, 313/663-1989

Free PostScript Font

LaserFonts, the world's largest PostScript font library. 32 font families and growing. ITC fonts. Rated four mice by *MacUser*. For a free, full-function font, send blank disk and business size envelope with 76¢ postage. Catalog with full-page samples, $2. Call or write for free info.
Century Software, Inc., 2483 Hearst Ave., #175, Berkeley, CA 94709, 415/549-1901, 213/829-4436

Beverly Hills 1.5

Major upgrade to what grateful users are calling "the best ImageWriter™ font on the market!" Hi-Q output in 11 sizes (including new 6-, 7-, 8-, and 11-pt.); larger 36-/72-pt. character set for newer Macs, leading/spacing in 2-/1- pixel steps, lines, 72 fractions, expanded manuals. Blank disc, plus $5 US ($5.33 in CA) registered users; or $15 US ($15.98 in CA) new users!
ADH Software, P.O. Box 67129, Los Angeles, CA 90067-0129

LaserPerfect™ Typography!

Distinctive, downloadable fonts feature legibility, good fit, kerning, old-style numerals. *Foreign:* Hebrew, Athina (Ancient & Modern Greek), Devanagari. *Book & Display:* MacSlab (square serif), Ambo, other fine type. *New!* Phonetic, OCR-A, LCD. $55-$125. Custom characters/fonts. Free brochure.
Neoscribe International, P.O. Box 633, East Haven, CT 06512, 203/467- 9880

○ *Genealogy*

MacGene™ (version 2.5)

60% faster & 100% complete. Designed specifically for the Mac. One program for data entry, search, select, list & charting. Features: History, Hints, Mail-List, Family Tree, Statistics, etc.
• LDS compatible • Mac's & Mac-XL
• Extensive Notes • User Fields
• Custom Reports • Import/Export
• No copy protect • 80 pg. manual
• $-back guarantee $145. Demo $25,
Applied Ideas, Inc., P.O. Box 3225, Manhattan Beach, CA 90266, Order info: 213/545-2996

Family Heritage File

Most powerful genealogy program on the Mac. Licensed version of *Personal Ancestral File,*™ produced by the LDS Church.
• Mac user interface • Supports all Macs & hard disks except 128K Mac
• Exports data to word processors/databases/modems
• Reports: Pedigree, Family Group, Individuals, Marriages, Surnames, Documentation, etc., $149 + $3 s/h (Utah res. +6%). Demo $7.
Star•Com Software Systems, Windsor Park East, 25 West 1480 North, Orem, UT 84057, 801/225-1480

FAMILY ROOTS™

Do it YOUR way! Huge variety and capacity for your family history. Makes pedigree charts and indices. Phased releases will add group sheets, searches and much, much more. Standard Mac screens/mouse. Free brochure and sample printouts. Satisfaction guaranteed. Currently $72.50, add $22.50 per each new release (total $185) MC/Visa/AE.
Quincept, Box 216, Lexington, MA 02173, 617/641-2930

○ *Graphics*

MacPerspective™

Allows architects, draftspeople, and artists to rapidly construct perspective drawings of houses, buildings, or other objects. Viewpoint can easily be changed. Drawings can be printer in any size up to 100 inches. Easy to learn and use. Fast, professional program with many features, thorough manual. $179.
B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

MGMStation–Prof. CAD

by Micro CAD/CAM, Inc. is a high powered CAD program for the Mac similar to AutoCAD. MGM boasts over 140 powerful functions including: *x-y* coordinate input, polar or digital data input, 100 power zoom accurate to 4 decimals, tangent drawing tools and much more! $799. Demo disk and/or VCR tape avail.
CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

Perspective Drawing

GridMaker:™ persective grid construction set. Create a variety of 3-dimensional grids that can be used within *MacDraw* or *MacDraft* as a guide for perspective drawing. Grid shape, dimensions, line density, rotation, and perspective are independently controlled. *Switcher* compatible $49. Visa/MC.
Folkstone Design Inc., P.O. Box 44, Grantham's Landing, B.C., Canada VON IXD, 604/886-4502

MiniCad 3.0

by Diehl Graphsoft boasts 1000+ power zoom, symbol library, 40 layers, auto-dimensioning, double-line tool, clip/add/intersect polygons tools, object snap, fillet & trim-lines tools, object sizer & locator, 9 decimals accuracy, full 2-D & 3-D modes, etc. It reads *MacDraw* & *MacDraft* files. $495. Demo avail.
CompServCo., 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

MacPlot & MacCAD

MacPlot by Microspot is a powerful plotter driver that will plot any object-oriented graphics produced on the Mac in up to 30 colors/pens. MacPlot supports over 50 plots, MacCAD is a series of 12 separate architectural & engineering template symbol libraries for use with *MacDraw, MacDraft, MiniCad,* etc.
CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

GraphPack Plot Library

Appends to a Microsoft FORTRAN program to generate charts/graphs. Includes industry standard calls (plot, line, axis, etc.) and 3D hidden-line routines. Direct interface to clipboard and printers (e.g. LaserWriter) for high-quality output. Graphs can be edited in *MacDraw.* Source code included. $69.95.
Lipa Software, 165 Harcross Rd., Woodside, CA 94062, 415/366-0547

GraphPainter™

Already proven in industry and university use! Does scatter, line, area, bar, column, overlays, log, semilog, multiaxis, multiseries & more. You control scaling, grids, markers, patterns, etc. Finish with the paint tools & 7 curve fits. Full I/O of data & graphics, undo & manual, 512K+ req. $50.
Greg Brasel, P.O. Box 4274, Chesterfield, MO 63006, 314/256-3317

Sizer & Adjacency

MacDraw DAs add CAD power ($69 w/installer. See 3/87 *Macworld*):
• Size any object by typing in dimensions, accurate to 0.0001 or 1/64" in architectural scale. Uses *MacDraw's* rulers. Copy and paste values for easy labeling.
• Adjacency forces objects together at near sides so edges are coincident.
Johnson & Johnson Design/Build, 677 Grove St., Newton, MA 02162, 617/253-5965

Fully Integrated CAD/CAM

A high-powered CAD/CAM system for the design and manufacturing of printed circuit boards, Douglas CAD/CAM Professional system features:
• Color layout on Mac II • Schematic captures with digital simulation
• Autorouter • Unlimited multilayers • Max. layout 32" × 32"-
Layout $1500, Schematic $700, Autorouter $700, full demo $25.
Douglas Electronics, 718 Marina Blvd., San Leandro, CA 94577, 415/483-8770

○ *Health*

Nutritional Software

Take steps to eat more sensibly. Analyze diets for nutritional content (calories, sodium, etc.) *Nutri- Calc Plus*™ includes 32 nutrients, 1700+ foods (3000 avail.). Offers RDA Comparison, tracks histories, energy analysis. $225. *Nutri-Calc*™ analyzes 8 nutrients, 900+ foods. Plots progress, analyzes recipes. $95. Both have brand name & fast foods, NCP.
CAMDE Corp., 4435 S. Rural Rd., #331, Tempe, AZ 85282, 602/821-2310

○ *HyperCard Stackware*

Business Info Stacks

Find help & information on state incorporation, licenses, taxes, company start-up, business planning etc. Just $9.95 for Small Business Guide HyperCard stacks listing state and federal government publications & other sources. Call for additional stacks, business workbooks, *Excel* templates, etc.
Business Library Software, 720 S. Hillview Dr., Milpitas, CA 95035,800/228-2275 (Nat.), 800/221- 4089 (CA)

HyperFacts™

Realize the full potential of your HyperCard with the *HyperFacts* line of products! Making a speech? Consult *Jokes On File.*™ Search full text or index field. Who supplies that Macintosh product you need? *MacVendors*™ knows! Not copy protected. $19.95 each + $2 s/h. Visa/MC. Free catalog.
Casablanca Software, P.O. Box 214, Dept MWB12, Hicksville, OH 43526, 419/542-8145

MacRecorder™

MacRecorder records *real* sound into your Mac. Simple to use. Just hold it in your hand & speak into built-in microphone, or record directly from your TV or stereo. Pkg. incl: *HyperSound*™ stackware lets you record & work w/sound from within HyperCard. *AudioFile*™ software records sound, then lets you edit & save files in a variety of formats including *HyperCard, StudioSession,*™ & *Beep INITs. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704, 415/849- 2331*

HyperBook™ Maker

Create books from *HyperCard* stacks. *HyperBook Maker* automatically lays out your pages so they fold to make a flip-top book. Lets you print on both sides. You just fold once and staple. Works for full, half- or quarter-size cards; all or part of a stack. Also prints both sides of page for notebook formats. *HyperBook Maker:* $59.95 postpaid. MC/Visa. *Ideaform Inc., P.O. Box 1540, 612 West Kirkwood, Fairfield, IA 52556, 515/472-7256*

Typeface Book and Stack

Virtually every PostScript font (all vendors), beautifully displayed & documented. For each type family, stack shows all styles, alphabets, character sets. Book adds sample usages & more. History & mood, usage hints, tech data & vendor/pricing info! *The Typefaces of DT Publishing*
- 800-HyperCard stack $24.95

DT Publishing Type & Graphics
- 300+ page paperback $29.95

Book & Stack Combo $39.95
Publishing Resources Inc., Boulder, CO 303/442-1100, orders 800/553-1666

Computer-Based Training

Tap *HyperCard*'s power in interactive Computer-Based Training (CBT) development. Two discs of stacks with ideas, routines, & training applications. Includes 60-page manual on using *Hypercard* for interactive CBT. Great for trainers, developers, entrepreneurs, and educators. Save weeks in creating interactive training stacks. Send check for $135 (payable to First Reference) to:
First Reference, Inc., 516 Fifth Ave. #706, New York, NY 10036, 212/730- 8211

HyperSource™

- *Hyper Business Tools*™ masters pop-up fields, buttons, mouse and dialogs. Included are complete business applications that manage customers, purchase orders, and service orders.
- *Hyper Talk Scripting Reference Guide*–The only reference needed $9.95. Free catalog, dealer and developer inquiries welcome.

HyperSource, 2619 South 302nd St., Federal Way, WA 98003, 206/946-2011

○ *Imports*

Japanese Software

E/G Word (Ergosoft Inc.) is a Japanese word processor; can turn romaji sentences into kana & kanji. $399. Req. 512K. Also:
E/G Bridges $249. *SWEET JAM 3.0* (A & A Co. Ltd.) Input Japanese in major Mac application software, $200.
- *Japanese Clip-Art* Vol. 1 & 2, $79.95 ea.
- *Mac Calligraphy* simulates medium of ink & brush on paper $149.95. (Enzan Hoshigumi Co.)

Qualitas Trading Co., 6907 Norfolk Rd., Berkeley, CA 94705, 415/848-8080

○ *Investment*

Profits!

Powerful, very fast, very flexible, *new* program allows you to pick winning trades, avoid the losing trades. Charting tools include stochastics, MACD, moving averages, RSI, and much more. For the stock, commodities, or options investor broker. $495. Orders & info requests only to 800/628-2828 ext. 403.
Button•down Software, P.O. Box 19493, San Diego, CA 92119,

The Investor

A powerful portfolio-management system designed especially for the Mac. For the sophisticated investor who manages a portfolio of financial securities such as stocks, bonds, options, funds, and treasury issues. The program accomodates cash & margin accounts. Modem required for auto-update via Dow Jones News/Retrieval. All Macs, 512K req. *Not copy protected.* $150. Money-back guarantee.
P3, Inc., 246 Nottingham Ave., Glenview, IL 60025, 312/729-2555

Portfolio/Market Link

- *Stock Portfolio System,* a complete portfolio manager, incl. 13 reports, tie to Dow Jones or manual update. Handles diversified investments.
- *Market Link,* auto fetch up to 120 quotes up to 8 times in unattended mode. Tie to DJ or Source. Bridge quotes to *Excel.* Free brochure + 100% rebate offer.

Smith Micro Software, Inc., P.O. Box 7137, Huntington Beach, CA 92615, 714/964-0412

○ *Languages*

FORTRAN + Mac Interface

McFace Tools 3.0 provides Fortran programs with Mac interface by modifying only three lines of code. Includes full DA, file, & edit menus and multiple windows. Source code included *McFace. sub* 3.0, allows further flexibility picture editing, alerts, dialogs, & more without a toolbox call. Tools $119, sub $40. Both $149.
Tensor Laboratories, P.O. Box 9723, Stanford, CA 94305, 707/763-7873

LISP Development System

MacScheme + Toolsmith™ has what you want for fast and easy interactive development: ● Native code compiler ● Stand-alone applications ● Easy-to-use window & menu objects ● Multitasking & interrupts ● A standard LISP dialect: Scheme 1 RAM, $395. Interpreted MacScheme™ still only $125. (Req. 512K)
Semantic Microsystems, Inc., 4470 S.W. Hall St., #340, Beaverton, OR 97005, 503/643-4539

○ *Law Enforcement*

MAC-A-MUG PRO

A complete, professional system for generating composite human faces. It provides a means for non-artist, law enforcement personnel to quickly assemble realistic composites based on eyewitness descriptions. Easily reproportion faces, edit with on-screen tools. Many print formats, frequent updates. $495 (MC/Visa, school pricing, approved PO.)
Shaherazam, P.O. Box 26731, Milwaukee, WI 53226, 414/442-7503

○ *Market Research*

MaCATI™

Computer Assisted Telephone Interviewing pkg. Survey/market research, political polling/telemarketing.
- Auto dialing
- Handles skip patterns
- Call records/appts.
- Statistics
- Networks interviews
- 500 questions/2yrs. in devlpmt.

$795 for 2 station pkg. $200 ea. additional pkg.
PSRC Software, Bowling Green State University, Bowling Green, OH 43403, 419/372-2497

○ *Mathematics*

PowerMath

Solves problems from simple algebra to complicated calculus expressions. You can differentiate, integrate, plot polynomial expressions, manipulate matrices, solve simultaneous equations, and create custom functions. If you are a student, engineer, or work with math, you'll love the easy-to-use versatility. Retail $100.
Central Products Corp., 2211 Norfolk #518, Houston, TX 77098, 713/529-1080

○ *Medical*

Medical & Dental Mgmt.

Solo or multipractitioner office includes patient (responsible party) billing, recall, paper/electronic claims, aging, collections, SuperBill, labels, diagnostic history, *Word/MacWrite,* audit & productivity reports. 24-hr. support. 512K+ hard disk or XL, MacSE & II. *Mac Office.* Demo from $100. AMEX/Visa/MC. 2400+ dealers.
CMA Micro Computer, 55888 Yucca Trail, P.O. Box 2080, Yucca Valley, CA 92286-2080, 619/365-9718

FamilyCare™ Software

This medical diagnostic expert system spares expensive, unnecessary trips to a physician by guiding you quickly through possible symptoms and giving specific directions for medical care, home treatment, and medications. Includes hundreds of symptoms, injuries, and diseases of newborns through teenagers.
FamilyCare™ Software, 29451 Greenfield Rd., #216, Southfield, MI 48076, 800/426-8426 or 313/559-4561

○ *Office Mgmt.*

Order House™

Integrated business environment, *Order House* is a multiuser, multistation application that integrates all the functions of a business. Includes sales and purchase orders, invoices, inventory, and accounting. Also features notes and list-mgmt., pictures, forms-mgmt., labels, and merged letters. We specialize in custom tailoring. Demo with video training tape avail. Call or write:
Elefunt Software, 724 Allston Way, Berkeley, CA 94710, 415/843-7725

○ *Payroll*

Time Saver Payroll™ V.3.0

Start the new year with this complete full-featured payroll system. Payroll System
● *Calculates* ● *Accumulates* ● *Prints reports* ● Salaried, hourly, & comm. wages ● 10 deductions, incl. fed. & state taxes ● Tax tables easily edited by user ● Monthly & quarterly reports, incl. 941, FUTA/940, SUTA ● Prints checks and W-2 forms ● *Flexible–easy to use!* Req. Microsoft *Excel* $75 + $3 s/h. MC/Visa/Chk. Demo $10 + $3 s/h.
Western Software Associates, 110 El Dorado Rd., Walnut Creek, CA 94595, 415/932-3999

A Great Value!

Fully featured Aatrix Payroll provides end-of-payroll, year-to-date, and quarterly summaries. Plus unemployment reports. Check design feature allows use of any payroll check. Capability to update federal tax tables and create state tax tables. Prints W2 statements. $99.
Aatrix Software,™ P.O. Box 5359, Grand Forks, ND 58206, 701/746-7202

○ *Printer Drivers*

Printer Choice for Mac

MAC DAISY LINK,™ a new member of the GDT family, is a single driver that allows any daisy wheel printer or properly interfaced typewriter to be used w/any Mac. User configurable ($82).
THE PRINT-LINK™ continues as the printer-specific family member that supports a variety of dot matrix printers (9 & 24 pin) & ink jet printers. Printers too numerous to list ($62). Both install using Choser. Mac to printer cable $22.95, LQ adapter cable $15.
GDT Softworks, P.O. Box 1865, Point Roberts, WA 98281-1865. Info: 604/291-9121, to order: 800/663-MACC (6222).

○ *Project Management*

AEC Information Manager™

Powerful, easy-to-use project-oriented database designed specifically for the *design* and *construction* industries. Allows project managers to schedule, organize and track: ● Correspondence ● Transmittals ● RFI's ● Revisions ● Change Orders ● Submittals ● Shop Drawings ● Punch Lists ● Projects. First of its kind!
AEC Management Systems, Inc., 20524 Amethyst Ln., Germantown, MD 20874, 301/428-3694

○ *Programming Tools*

Programmer's Extender™

Compiled libraries speed up Macintosh application development. Vol 1: windows, menus, text edit, scroll bars, dialogs. Vol 2: list mgr. support, text & graphics printing & I/O, marquee, lasso, zooming, & tiling windows. Avail. for *LightspeedC, TML Pascal,* & *Lightspeed Pascal.* $89.95/volume.
Invention Software Corp., P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

Extender GrafPak™

Compiled libraries for creating professional quality graphs in your applications. Line, scatter, bar, column, log, semi-log plots. Customizable tick marks, plot symbols, grid patterns. Multiple curves & patterns. Available for Turbo, Lightspeed, & TML Pascal $69.95.
Invention Software Corp., P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

○ *Public Domain*

PD Software Club

We have the best in proven updated PD software. We scour all the national and local sources for you. Our 50 disks contain only current versions of over 1000 items. $2 gets you our catalog & a $2 coupon. $20 annual membership fee gets you monthly newsletters and 2 FREE disks of fonts and DAs. Monthly disks $6.95, library disks $8.95. Visa/MC.
Translatum International, 2501-A Parker Lane, Austin, TX 78741, 512/442-0266

Best Value Mac Software

Best value in public domain software with 2500+ programs & tons of stackware. Disk are packed to the brim with the latest quality software releases. No minumum. Double-sided disks available. Free membership, bulletins, & beautifully detailed illustrated catalog, $1.50 required/$2.50 foreign.
MCUS, P.O. Box 6963, Dept. 55, San Jose, CA 95150, 408/723-3388

More Bytes for your Buck!

Choose from our HUGE library of 2700+ programs, games, DAs, fonts, & artwork at only $3.50 per disk or 3/$10! No membership fees, no minimums, no gimmicks. Just great software at honest prices. Disks are packed full with the latest releases. Send $1 for our 100-pg. catalog describing all programs. MC/VISA. See display ad this issue!
Budgetbytes,™ P.O. Box 2248 Dept. A, Topeka, KS 66601, 913/271-6022 (for info.), 800/356-3551 (order only)

The Mac Group

The best public domain software & user group services
● PD disks (low as $2.37 each)
● LifeTime Membership ($15)
● BigTime Membership ($72 yr.) Includes 2 PD disks monthly
● Roll-Your-Own PD Catalog ($5)
● Special Art Set ($50 + $3 s/h) Includes 12 Clip Art disks.
Send $1 for catalog. Visa/MC
The Mac Group, P.O. Box 85152 MB 231, San Diego, CA 92138, orders only 800/621-5640 XMAC GRP

2800+Programs•Tips•Nwsltr

No club has more programs or a better newsletter. Members in 35 countries. 1-time $8.50 subscription gets you our intro. disk w/13 terrific programs + disk w/description of our HUGE library of over 2800 programs PLUS our quarterly newsletter filled with tips and new programs. Members pay $7 for any disk (plus $1 s/h).
PD Mac, Dept. 112, P.O. Box 5626, Sherman Oaks, CA 91423

○ *Real Estate*

Property Management

Comprehensive program for managing residential and commercial properties. Many management reports, including operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses –$395. Investment analysis–$245.
Yardi Systems, 930 Laguna St., Santa Barbara, CA 93101, 805/966-3666

Investment Analysis v. 5.1

From RealData, the leader in real estate software. Latest tax reform rules incl. in powerful sensitivity analysis for income property. Detailed 10-yr. report of income, expenses, financing, depreciation, cash flows, tax consequences (incl. passive losses), future value & resale, IRR/FMRR/cash-on-cash/cap. Rate, lease analysis & more. Flexible, easy to use. Req. *Excel,™ Works,™* or *Jazz.™ $195.* MC/Visa/Amex/COD
RealData, Inc., 78 North Main St., South Norwalk, CT 06854, 203/255-2732

Property Management

New version from RealData,® Inc. Use PM, Level 2, to manage up to 250 residential or commercial tenants. Receipts/disbursement journals, extensive property profiles, receivables and billing, check writing, common charges, individual property financial statements, and more. Easy to use. Req. *Excel,™* hard drive. $295.
RealData, Inc. 78 N. Main St., S. Norwalk, CT 06854, 203/255-2732

Income Property Analysis

REMS Investor 1000, 2000, 3000. Multi-year cash-flow analysis using new tax law. Range from REMS Investor 1000 for private investors at $195, to the 3000 for partnerships, ground leasing, participations, and more at $795. 100% upgrade credit, 30-day $$-back guarantee! No templates. Call to specify free demo disk.
REMS Software, 3860 159th Ave. NE #110, Dept MW2, Redmond, WA 98052, 206.883-7000

Loan Amortization
AmPack is a straightforward loan-amortization software package designed by a CPA & tax attorney. *AmPack* supports variable rates, graduated, skipped, & principal-only payments. Also includes balloons, negative amortizations, customized schedules, loan analysis, & more. $49.50 + $5 s/h. MC/Visa.
Softflair, Inc., 8753 Park View, Milwaukee, WI 53226, 414/778-7200

Property Management
Complete manager's tool for residential & commercial properties. Features include full accounting & budgeting, operating statements, & easy starting balances; Rental, Repair & Tenant Managers; auto. rent increase & late fees; over 40 reports per IREM specs; *Personal Investor* $595, *Professional* $1,295.
MacLord Systems, Inc., 9487 Magnolia Ave., Riverside, CA 92503, 714/687-1919

TRACK™
Multi-user database for tracking clients & prospects; contact history, mail labels & more. Also includes electronic index cards, appointment calendar, auto-dialer, mortgage calculator, expense log, tickler & terminal function. 1 of 8 new products in 1987. $395.
Softworks, Inc., P.O. Box 2285, Huntington, CT 06484, 203/926-1116

FOR SALE™
Multiuser farming system for increased sales and listings. Maintain database on all property types including property description and owner. Search by any field; mail labels; contact history; & more. Includes appointment calendar, auto-dialer, & tickler functions. Great for market evaluations! $695.
Softworks, Inc., P.O. Box 2285, Huntington, CT 06484, 203/926-1116

LIST™
Multiuser property listing system maintains listing info for lease & sale properties including pictures, keeps comparables for CMA's. Search any field. Reports & graphs. User-customizable. Like having your own multiple listing system. 1 of 8 new products in 1987, $795.
Softworks, Inc., P.O. Box 2285, Huntington, CT 06484, 203/926-1116

LEAD™
Multiuser management system for the solicitation of owners selling their own properites. Classify leads. Sales forecasts and YTD reports & graphs. Also includes electronic index cards, auto-dialer, & tickler functions. $595.
Softworks, Inc., P.O. Box 2285, Huntington, CT 06484, 203/926-1116

MacAppraiser™
Easiest and fastest processor on the market. Stand-alone program completes URAR, CONDO and INCOME. Forms excatly duplicated on screen, unfilled areas highlighted, word-wrap, drawing capability for URAR sketch; performs all calculations including sketch area, batch printing. Super fast scrolling. Complete URAR in 15-30 min. $395.
Bradford and Robbins, 22656 Silver Oak Lane, Cupertino, CA 95014, 408/996-2331

○ *Rental*

Original MacLibrary, Inc.
Try before you buy...low 16-day rental rates that apply towards purchase–no obligation to buy. We offer a huge selection of Mac software. All the popular programs plus plenty of hard-to-find titles. No fees. Free membership. Special discounts for rapid returns. Plus FREE assistance HOT LINE. Whatever you're looking for, if it was made for the mac, we probably have it...at LOW RATES.
The Original MacLibrary, Inc., 17280 Newhope St. #3, Fountain-Valley, CA 92708, 714/957-5767, 800/426-2777 (CA), 800/622-4774(Nat'l)

○ *Restaurant*

Restaurant Management
Total control for any size restaurant. System includes: inventory control, menu management, help screens, documentation, hotline support, $995. Accounts payable, accounts receivable, restaurant payroll, and general ledger. $175. Visa/MC Demo $30. Req. MacPlus & Omnis3. Dealers invited. Money-back guarantee.
Keller Systems Inc., 105 Narcissus St. #310, West Palm Beach, Fl. 33401, 305/833-3358, 800/458-8430

○ *Retail*

db:$ Retailer's Advantage™
Turns one or more Macs into cash registers supporting inventory control, receivables, POs. This powerful system compares to others costing 4X. Retailers are different & a whole menu of programs supports the way you do business. Discounting & quantity pricing is supported. Whether you sell durable or apparel items, this can do it for you. System may include a cash drawer, slip printer, ImageWriter & 20MB Mac.Turnkey systems from:
db: Solutions, 138 S. Orchard, Vacaville, CA 95688, 707/448-9500 or a db: agent or authorized reseller

○ *Sales/Marketing*

Market Master for the Mac™
Automatic Sales Inquiry Follow-up! Enter leads whenever you get them and *MarketMaster*™ contacts the right people the right way at the right time. Prints letters & envelopes, phone lists, scripts, and NEVER FORGETS! Easy to learn and use. Free-salespeople to SELL and supports them to SELL MORE!
Breakthrough Productions, 10659Caminito, Cascara, San Diego, CA 92108, 619/281-6174

○ *Security*

Advanced Copy Protection
The leading software manufacturers depend on Softguard copy protection. Introducing our *Protection Kit*, a complete copy protection system that runs on the Macintosh.
- Stops all copybusters
- FULL HARD DISK support
- No source code changes
- Compatible with all Macintosh systems. Free demo disk.

Softguard Systems, Inc., 710 Lakeway #200, Sunnyvale, CA 94086, 408/773-9680

○ *Statistics*

CLR ANOVA
Analysis of variance program that can compute up to a 10-way design with repeated measures and unequal *n*. Marginal means, plots of interactions, simple effects, range tests, contrasts, and more. Full Mac interface. Two data editors provided. Can read text files w/entries separated by spaces, commas, or tabs. $75 + $3 s/h.
Clear Lake Research, 5615 Morningside #127, Houston, TX 77005, 713/523-7842

RATS! Version 2.1
Best-selling econometrics software program. Now available on the Mac. Multiple regression, including stepwise, 2SLS, logit, probit, and much more! Forecasting with ARIMA, VAR. Exponential smoothing, model simulations, support for daily/weekly data. $300. Visa/MC. 512K + external drive.
VAR Econometrics, Inc., P.O. Box 1818, Evanston, IL 60204-1818, 312/864-8772, 800/822-8038

Wall Street "Watcher"™
"Watcher" is the state-of-the-art stocks and commodities technical analysis software for the Macintosh user. Features: cycle and trend-line analysis, four graph sizes display any of 15 indicators: stochastics, MACD, moving averages, oscillators, OBV, etc. User friendly. Automatic quote. $250. Demo disk $15. Free information.
Micro Trading Software Ltd., 123 Hulda Hill Rd., Wilton, CT 06897, 203/762-7820

○ *Word Processors*

Expressionist™
An equation editor that generates typeset quality mathematical expressions for any WP or DTP document. Awarded five mice in *MacUser* review: "It's exactly the equation processor you'd write for yourself.... Equation manipulation has never been easier." DA for 512KE thru II. Send $79.95 + CA tax + $2.50 to:
Allan Bonadio Associates, 1579 Dolores St. #10, San Francisco, CA 94110, 415/282-5864

MacΣ/Equation Writer
*Mac*Σ is a desk accessory equation processor that lets you include complicated mathematical equations in your technical documents. *Mac*Σsupports integrals, sums, products, multiline expressions, roots, super & subscripts on the same character. Automatic character sizing, etc., $44.95 Educational discount available. Version 2.1 now being released.
Software for Recognition Technologies, 55 Academy Dr., Rochester, NY 14623, 716/359-3024



This software was developed and is marketed by Reality Technologies, Inc. in association with Business Week. BusinessWeek's Business Advantage is a trademark of McGraw-Hill, Inc. Microsoft is a trademark of Microsoft Corp. © 1987 Maxell Corp. of America, 60 Oxford Drive, Moonachie, NJ 07074

Give yourself a business advantage. Free.

It's a special edition of BusinessWeek's Business Advantage™ software, a $50 value, free on the 11th disk in specially marked 10-packs of Maxell MF2-DD disks. This business simulation software puts you at the helm of Microsoft in its battle with other titans of the software industry. It's fun, informative and free at your favorite Maxell dealer, while supplies last.



maxell®
THE GOLD STANDARD

Macworld Best-Sellers

Business Software

Months on chart	Last month	This month	
31	1	1	**Microsoft Word** *Microsoft*
11	4	2	**Microsoft Works** *Microsoft*
23	2	3	**Microsoft Excel** *Microsoft*
19	3	4	**PageMaker** *Aldus*
9	6	5	**SuperPaint** *Silicon Beach Software*
27	5	6	**MacDraw** *Apple Computer*
4	7	7	**WriteNow for Macintosh** *T/Maker*
1	–	8	**Cricket Graph** *Cricket Software*
4	9	9	**MacMoney** *Survivor Software*
2	10	10	**ReadySetGo** *Letraset*

Education Software

15	2	1	**Math Blaster** *Davidson & Associates*
13	3	2	**Typing Tutor III** *Simon & Schuster Computer Software*
15	1	3	**KidsTime** *Great Wave Software*
2	5	4	**Speed Reader II** *Davidson & Associates*
1	–	5	**Speller Bee** *First Byte*

Entertainment Software

15	3	1	**Flight Simulator** *Microsoft*
11	1	2	**Dark Castle** *Silicon Beach Software*
15	2	3	**MacGolf** *Practical Computer Applications*
2	4	4	**Hardball** *Accolade*
4	5	5	**Ferrari Grand Prix** *Bullseye Software*

Networking/Data Communications

15	1	1	**AppleTalk** *Apple Computer*
11	2	2	**TOPS** *TOPS*
7	3	3	**AppleShare** *Apple Computer*
14	4	4	**MacServe** *Infosphere*
3	–	5	**PhoneNet** *Farallon Computing*

Hard Disks

Months on chart	Last month	This month	
11	1	1	**Apple Hard Disk 20/20SC** *Apple Computer*
4	2	2	**Macintosh Internal 20SC Hard Disk** *Apple Computer*
5	3	3	**Rodime 20 Plus** *Rodime Peripheral Systems Division*
1	–	4	**Apple Hard Disk 40SC** *Apple Computer*
15	4	5	**DataFrame XP 20** *SuperMac Technology*

Add-in Boards

2	2	1	**Apple 1MB Memory Expansion Kit** *Apple Computer*
2	3	2	**Radius Accelerator** *Radius*
2	4	3	**Apple 2MB Memory Expansion Kit** *Apple Computer*
1	–	4	**Macintosh II Video Card** *Apple Computer*
2	1	5	**MacSnap** *Dove Computer*

Product Watch

Editors' choice:
Other recent products of particular interest.

Cricket Presents *Cricket Software* presentation software

Freehand *Aldus* PostScript drawing program

Interleaf Publisher *Interleaf* high-end electronic publishing software

Source: Exclusive InfoCorp survey of more than one hundred twenty-five Macintosh retailers and selected mail-order suppliers. Covers sales during September 1987.

** Does not include hard disks installed at the factory.*

The Word is Out...

"Absolutely AMAZING word processing program. I want it WriteNow!"

Robert Forras, MacTimes

"WriteNow feels perfect.... It's hot. Highly recommended. This is THE word processor to use if you use a Mac."

John Dvorak, San Francisco Examiner

"Right now, WriteNow comes the closest to delivering on the promise of future word processing."

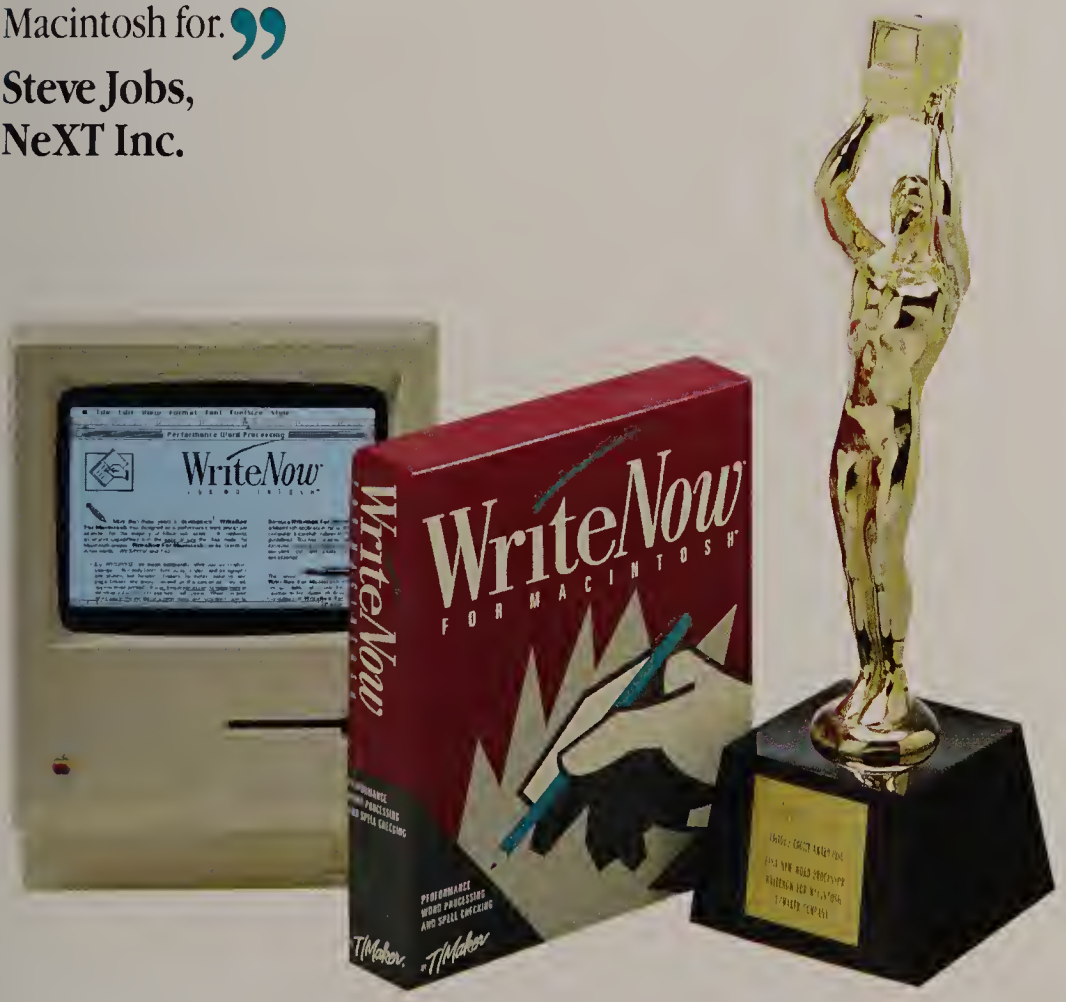
Michael Miller, InfoWorld

"This is the word processor that we designed and built Macintosh for."

Steve Jobs, NeXT Inc.

"T/Maker's WriteNow For Macintosh is a polished word processor that retains the elegance of MacWrite but adds features like multiple windows, footnotes, multiple columns, and a spell checker."

Dan Farber, MacWorld Magazine



"...WriteNow adds up to a great new word processor. ...its ease of use and speed put it way ahead of Microsoft Word and MacWrite for most jobs."

Vicky Jo Varner, The MACazine

Best New Word Processor
MacUser Magazine 1986

WriteNow FOR MACINTOSH™

Performance Word Processing for the Macintosh

To learn more, see your local computer dealer today, or call or write to:
T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043 (415) 962-0195

Suggested retail price of WriteNow For Macintosh is $175. Runs on any Macintosh.

T/Maker®

Pagemaker 2.0 now imports & exports WriteNow documents.

T/Maker is a registered trademark of T/Maker Co. WriteNow is a trademark licensed to T/Maker Co.
Macintosh and MacWrite are trademarks of Apple Computer, Inc.

Circle 332 on reader service card

January 1, 1988 I resolve to...

Having trouble coming up with this year's resolutions? Tired of "I resolve to lose weight, quit smoking, and work out every day?" Don't despair, we've worked up a whole list of snappy new resolutions for you to choose from. So, repeat after us—I resolve to...

1. Keep all my computer equipment nice and clean. (This will not only improve your computer's performance, it'll make your mother happy. Easily achieved with Dust Covers and Cleaning Kits.)

2. Protect my Mac from (a) power problems with a System Saver® Mac and (b) the criminal element with an Apple® Security System.

3. Stop annoying people with my ImageWriter®. (No, don't throw it out, just put a Printer Muffler™ on it.)

4. Stop cursing my mouse when it runs off the edge of the desk. (Hint: space is no problem with a Turbo Mouse™.)

5. Lose weight, quit smoking, and work out every day. (Just kidding.)

6. Call Kensington for more information. (Maybe you should make this #1.) Call (800) 535-4242. Outside the US, or in NY, call (212) 475-5200.

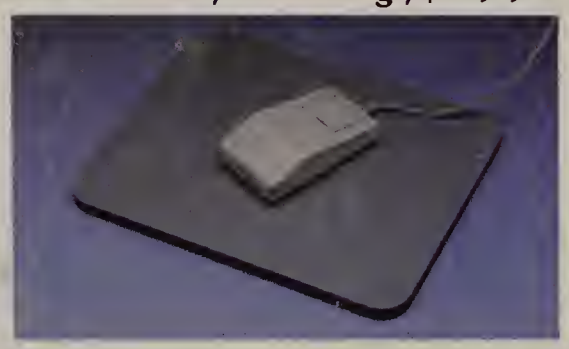
KENSINGTON™



System Saver Mac, $99.95*



Turbo Mouse, ADB or reg., $129.95



Mouseway, $9.95



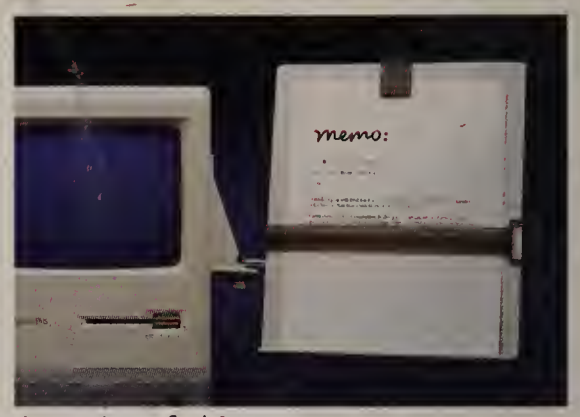
Anti-Glare Filter, $49.95*



Printer Stand, $19.95



Tilt/Swivel, $34.95



Copy Stand, $29.95



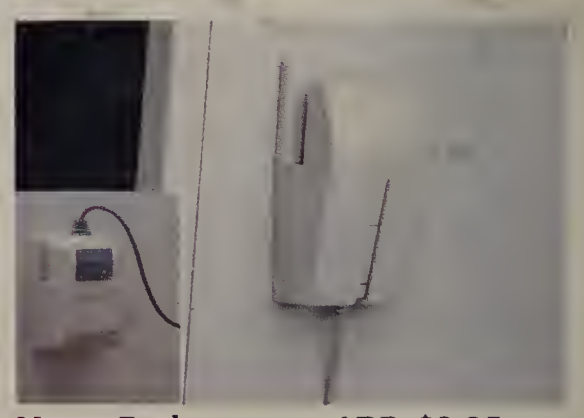
Printer Muffler 80, $59.95
Printer Muffler 80 Stand, $29.95



AppleTalk Clips, $25.00 for 25



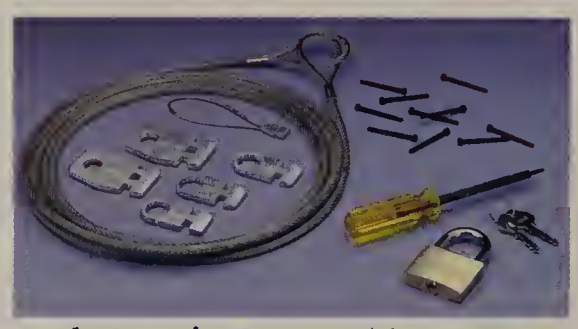
Dust covers, $9.95 to $24.95



Mouse Pocket, reg. or ADB, $9.95



Disk Drive Cleaning Kit, $29.95
Mouse Cleaning Kit, $24.95



Apple Security System, $49.95



Disk Pocket, $9.95

*Available in two colors—original Apple Beige and new Apple Platinum.

Circle 11 on reader service card

Trademarks System Saver, Maccessories, Turbo Mouse, Printer Muffler/Kensington Microware Ltd Apple, Mac., Macintosh, Apple Talk, ImageWriter/Apple Computer Inc © 1987 Kensington Microware Ltd.